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Stress Factors and Nutrition[1]

MARVIN L. MITCHELL, M.D.[2]

Institut de Médecine et de Chirurgie Expérimentales (Professor Hans Selye, Director), Université de Montréal, Montreal, Canada

IF ONE stops to consider this so-called civilization of ours, then I think one can readily understand the reasons behind the emphasis placed on stress. Each day brings with it some new conflict, some new threat; or perhaps just repetition of the old ones . . . the situation in Korea . . . the possibility of another world conflagration . . . competition . . . survival . . . all these, plus many other similar factors, result in the production of multiple stressful situations.

It is my earnest hope that in attempting to explain the concept of stress as postulated by Selye (1), there will result a multitude of unanswered questions in your minds. Especially in the field of nutrition does one encounter a host of seemingly confusing problems. Your knowledge, coupled with a native curiosity, has the potential to produce the very answers to the questions which plague us all.

That many are already at work trying to uncover the unknowns in stress can readily be appreciated when one realizes that more than five thousand articles were published in 1952 concerned with the complexities incurred in stress research.

EVALUATION OF STRESS

A group of investigators at Harvard University a few years ago decided on a rather unique experiment (2): to investigate the individual role that emotions play and that the soma plays in the production of stress. Using the crew of the Harvard rowing team, they did base line eosinophil studies while the men were in resting states. Then they awaited the day of the big race, the grueling 4-mi. classic between Harvard and Yale. Immediately after the race, the investigators gathered their equipment together and hurried to the docks. There they did eosinophil determinations again.

Actually what they were after was to test the integrity of the pituitary-adrenal axis and its response to stress as reflected by a drop in circulating eosinophils. The results of the eosinophil counts proved to be of the utmost significance.

The average resting value for all eosinophil determinations was approximately 110 eosinophils per cubic millimeter. The eosinophil counts done on the various participants within 4 hr. after the race indicated that the crew had suffered a drop in circulating eosinophils of approximately 55 to 65 per cent. This response can be attributed to a combination of emotional and physical stress. An eosinophil determination was likewise done on the coxswain. He suffered a similar drop. Since his job demands very little physical output, his response can be blamed largely on emotional stress. For the sake of completeness, an eosinophil count was also done on the coach. The result proved to be little less than startling. He suffered a drop in eosinophils comparable to that of the crew and coxswain. This is of extreme importance because the coach has no physical activities during the race. He just sits on the side lines, gnashes his teeth, and perhaps prays. His response is purely emotional.

I think this has tremendous implications, not only for all the coaches throughout the country, but for you and me. What we see here is a part of the general adaptation syndrome, a mechanism serving normally for defense against disease. In the laboratory, a few minor deviations change this physiologic general adaptation syndrome from a mechanism of defense against disease to a mechanism that can produce disease. For example, with the so-called mal-adaptation syndrome in the experimental animal, there result nephrosclerosis, myocarditis with lesions, coronary sclerosis, hypertension, periarteritis nodosa, arthritis, gastroduodenal ulcers, and even cerebral vascular sclerosis with hemorrhage and edema.

Certainly, the laboratory worker encounters many stressful situations in a single day. It is rather provocative to speculate on the number of times our own eosinophils take similar plunges in situations of duress.

HISTORICAL BACKGROUND

In a sense, the idea of stress is not new. Ever since man has used the word "disease," he has had some

[1] The Annual Mary Swartz Rose Memorial Lecture presented by the Greater New York Dietetic Association on February 17, 1953, in New York City.

[2] Public Health Research Fellow of the National Heart Institute.

subconscious inkling of the stress concept. The very fact that a single term, "disease," can be used to denote a great variety of individual maladies clearly indicates that they have something in common. They possess some nonspecific features which permit us to distinguish the condition of disease from that of health. Yet, precisely because these manifestations are not characteristic of any one disease, they do not aid in arriving at a differential diagnosis.

In the early phases of research, the nonspecificity of disease received little attention. Most of the emphasis was placed on specific causal agents and the specific diseases they effected. This trend towards specificity ranged all the way from the specific microbe to the specific vitamin as the culprit in the manifestations of disease.

However, there were some men who tried to look beyond the curtain of specificity and devoted much of their energy to elucidate the mechanism involved in nonspecific reactions. We are indebted to such men as Hoff and von Linhardt, Ricker, Speransky, and Reilly for important data concerning the role of the nervous system in such nonspecific reactions as fever, leucocytosis, and inflammation (3–6). Walter Cannon (7) helped to define the part played by the sympathetic nervous system and its humoral effectors in so-called physiologic stress. All the knowledge acquired as a result of these early investigations was indispensable for the formulation of the stress concept, whose *leitmotiv* is actually one of unification.

STRESS DEFINED

What, then, is stress?

When any living animal or organism is placed in an abnormal environment or abnormal condition which endangers its vital equilibrium, it will react and struggle against it. Remarkably enough, the reaction pattern exhibited by this systemic response is stereotypical. Disregarding the nature of the insult, the characteristics manifested systemically are always identical. Indeed, one may subject experimental animals to severe surgical operation, cold, excessive heat, forced muscular exercise, repeated injections with toxic drugs, irradiations with x-rays or atomic disintegration products, hemorrhages, burnings, psychic or dietetic disturbances—and in every instance, the same biologic phenomena will be elicited.

It is this stereotypical pattern of nonspecific response, superimposed on the specific effects of the insulting agent, that we call the somatic manifestations of nonspecific stress itself.

THE ALARM REACTION

The sum of all the biologic phenomena resulting from stress can initially be called the alarm reaction. One can visualize this as a call to arms of the defenses of the body. This alarm reaction—that is, all the nonspecific manifestations—is exhibited whenever an organism is subjected to external aggressive agents to which it is adapted neither qualitatively nor quantitatively.

What are these reactions, these manifestations of the alarm reaction? They are twofold—some being the effects of the damage created by the aggressive agent (which can be called the "stressor"), others being the results of the active defense mechanism themselves.

For example, you are all familiar with the state of shock that follows every severe aggression, be it medical or surgical. This, then, is the best example of the sign of damage created by the stressor. There is hypotension, hypothermia, hemoconcentration, and in the experimental animal, there is adrenocortical enlargement with histologic signs of hyperactivity, thymic and lymphatic involution with a concomitant change in the blood picture (eosinopenia and leucocytosis), and acute gastrointestinal ulcers reminiscent of what clinicians have described in the past as "air-raid ulcers."

These, then, are the manifestations of the alarm reaction. But how does that fit into the picture of the general adaptation syndrome? Interestingly enough, it was subsequently learned that the alarm reaction is but the first stage performance of a three-act play, the name of which is the "General Adaptation Syndrome."

In other words, one goes from the stage of alarm to the stage of resistance and hence to the stage of exhaustion. The stage of resistance is the stage in which adaptation is maximal. The stage of exhaustion is exactly as it is defined, sheer exhaustion; the animal's defenses have broken down under the continual stress and it is no longer able to adapt; as a rule, death will ensue.

HORMONAL DYNAMICS

That, then, is a very brief description of the general adaptation syndrome. Before elaboration of the individual stages, I should like to digress long enough to consider the dynamics that have been predicated to occur during the syndrome itself.

For simplicity's sake, let us visualize some portion of the body, such as an arm or a leg, that has just received a severe burn. With the insult to the skin, there results both a local reaction and a systemic reaction. Locally, one sees some hemorrhage, some edema, a break in continuity of the skin, and later, perhaps, tissue necrosis. Our concern is primarily focused on the systemic reaction. With the damage to the tissue, there is released some unknown factor, or factors, the so-called "first mediator of hormonal defense." Just what this mediator is has not been defined. Perhaps it is adrenalin, a histamine-like substance, a toxic tissue metabolite, an enzyme, or a deficiency in some blood-borne component. Whatever the mediator be, a stimulus is carried to the anterior pituitary gland, via an unknown pathway, which causes the anterior pituitary to secrete adrenocortico-

trophic hormone (ACTH). ACTH, in turn, stimulates the adrenal cortex to secrete steroid hormones of the mineralo-corticoid type and the gluco-corticoid type.

The mineralo-corticoids, that is the desoxycorticosterone-like compounds, have the capacity to stimulate the proliferative ability and reactivity of the connective tissues. They enhance the inflammatory potential. Thus, they help put up a strong barrier of connective tissue through which the body is protected against further invasion by pathogenic stressor agents. For this reason, the mineralo-corticoids may also be called prophlogistic corticoids.

Under ordinary conditions, ACTH stimulates the adrenal cortex much more effectively to secrete the gluco-corticoids, cortisone-like compounds. These inhibit the ability of the body to put up granulomatous barricades in the path of the invader; in fact, they tend to cause involution of the connective tissue with a pronounced depression of the inflammatory potential. Thus, they open the way for the spreading of infection. The gluco-corticoids can, therefore, also be called antiphlogistic corticoids.

You will recall that the mineralo-corticoids are predominantly concerned with mineral metabolism, that is, the retention of sodium and chloride and the excretion of potassium. The biochemical effects of the gluco-corticoids are concerned predominantly with gluconeogenesis, that is, the manufacture of sugar from non-sugar and the storage of liver glycogen. However, all gluco-corticoids possess some degree of mineralo-corticoid activity as far as the electrolyte influence is concerned.

There is just one more fact to be mentioned in connection with the pituitary-adrenal-cortical axis. At the time of ACTH release from the anterior pituitary gland, it is felt that there also might be a concomitant discharge of STH (somatotrophic hormone). It is believed that STH is intimately linked with the effects of the mineralo-corticoids. However, the role of STH in the scheme of things is relatively new and not well understood. What little information is available concerning its activity will be brought out later, when we discuss diseases of adaptation.

THE STAGES

That, then, is the pattern of the anterior-pituitary-adrenal system initiated during the alarm reaction that provides the organism with what is normally a stable defense mechanism. If the stress situation is relieved during the alarm reaction, the organism will not have to fight against further aggression, endocrine hyperfunction will soon subside, and metabolism will come back to normal. If, on the contrary, there is no abatement of the stressful situation, then the body will persist in its efforts to defend itself against this abnormal condition to which it has tried to adapt.

Soon the organism reaches what is called the stage of resistance, the second stage of the general adaptation syndrome. This is the stage in which the organism has developed optimal adaptation toward the stressful situation. The body has become fully inured to the insults, since everything abnormal in the alarm reaction disappears.

Repetition of further exposure to stress does not cause any more shock; if there have been gastric ulcers, they are healed; the big brown, overactive adrenal gland recharges itself with secretory lipids; the hypotension, the hypothermia, the hypoglycemia, the hypochloremia, and the hemoconcentration—all characteristics of the alarm reaction—have disappeared. Thus, the organism is almost normal in appearance, and it has overcome the brutal exposure to stress to which it is now optimally inured and adapted.

But, it has achieved this optimal adaptation only at the expense of other functions. For example, the shift in pituitary hormone production necessary to maintain a long-standing ACTH secretion during this period of continual stress has resulted in a decreased production of other less vital pituitary hormones. For this reason, one will see partial atrophy of the gonads in animals suffering from chronic stress situations. This same phenomenon can be observed in man in situations of chronic starvation, notably, the castration syndrome seen in prisoner-of-war camps during World War II.

This adaptation to a stressful situation cannot go on indefinitely. Eventually the animal must reach the stage of exhaustion—the third and last stage of the general adaptation syndrome. There is a collapse of the defense mechanism with inevitable death. Interestingly enough, this stage is morphologically identical with those signs exhibited during the alarm reaction.

We may recapitulate by saying: the organism has been attacked by a stress and has reacted against it—that is the alarm reaction. It has adapted itself for a long period to the aggressive agent—a period known as the stage of resistance. Finally, the defenses undergo deterioration, and the stage of exhaustion follows. This three-stage pattern is what is now called the "general adaptation syndrome."

DISEASES OF ADAPTATION

Logically, the question to be proposed next concerns the diseases of adaptation. Just what is meant by diseases of adaptation? I should like to try to answer that question with a quotation from Selye's book titled *The Story of the Adaptation Syndrome* (8):

"The hormonal defense reactions of the adaptation syndrome are not, in themselves, pathogenic; on the contrary, they are indispensable physiologic reactions to damage as such. However, the adaptation syndrome like any other biological response is not always optimally effective. I believe that its

imperfections play an important part in the pathogenesis of most diseases. The maladies in which such inadequacies are even more important than the specific actions of the pathogen itself, are considered to be primarily diseases of adaptation."

The key words in that paragraph are "imperfections" and "inadequacies." Thus, we may define the diseases of adaptation as being the imperfections and/or the inadequacies of the general adaptation syndrome.

There can be no doubt that the activation of the pituitary-adrenal-cortical system represents an integral part of the adaptation syndrome and is elicited by all stressors. This response is a necessary and useful defense mechanism. To demonstrate this, all one need do is remove either the pituitary gland or the adrenal cortex and observe that many of the characteristic manifestations of the adaptation syndrome are blocked, and that resistance to any kind of a stressor becomes extremely low.

FACTORS FAVORING DISEASE

Yet, a great excess in the production of such pituitary or adrenal adaptive hormones may have its drawbacks in the form of disease. It has been noted that in the presence of certain favoring factors, or conditioning factors—such as diets rich in protein or sodium—if the animals are exposed to stress, such as cold, for a sufficiently long time, they will develop lesions identical with those seen in rheumatic fever, such as arthritic or myocardial nodules; or, they will develop lesions identical with those seen in the nephropathies, with high blood pressure, nephrosclerosis, periarteritis nodosa, brain hemorrhages, or myocardial infarcts.

From these observations, it was concluded that the pathogenicity of many systemic and local irritants depends largely on the functions of the hypophyseal-adrenal-cortical system. The latter may either enhance or inhibit the body's defense reactions against stressor agents. The idea, therefore, arose that during adaptation to any kind of a stress, such as the strain and anxiety of everyday life, some derangements of the endocrine and metabolic mechanisms responsible for the building up of adaptation could lead to these pathologic responses. Indeed, all the lesions named thus far can be reproduced by overdosing the experimental animal with the hormones of the glands that are known to be overactive during the build-up of the adaptation to stress.

With the hormones of the prophlogistic type, one is able to produce experimental replicas of the so-called hypertensive and inflammatory rheumatic diseases, notably: nephrosclerosis; hypertension; vascular lesions; as well as arthritic changes resembling, in the acute experiments, those of rheumatic fever, and after chronic treatment, those of rheumatoid arthritis.

Furthermore, certain crude anterior pituitary extracts have duplicated the actions of the prophlogistic corticoids on the cardiovascular system, the blood pressure, the connective tissue, and the kidneys. These hypophyseal preparations have proved to be corticotrophic in that they enlarge the adrenal cortex. They were found to be particularly rich in ACTH and STH. Overdosage with purified preparations of ACTH failed to produce the previously mentioned lesions of the prophlogistic corticoids, so that it could be assumed that the pathogenicity of the crude anterior pituitary preparations are not due to the ACTH content. On the other hand, overdosage with purified STH caused cardiovascular and renal lesions identical with those observed in the animals treated with prophlogistic corticoids. It was concluded that the lesions produced by the crude anterior pituitary preparation were the results of the STH content.

ROLE OF STH

It remains to be seen to what extent STH acts indirectly by stimulating the prophlogistic corticoid production of the adrenal cortex, or directly by sensitizing the peripheral tissues to the actions of the prophlogistic corticoids. Preliminary observations suggest that both of these mechanisms may be implicated. However, for now, the more interesting role of STH is that it can effectively combat catabolism and sensitivity to infections.

Animals heavily overdosed with ACTH or cortisone tend to lose a great deal of weight. Eventually they die, almost always as a result of a generalized septicemia caused by normally saprophytic microorganisms. In rats, the lung tissues seem to be singularly predisposed to such infections. Under these conditions, adequate doses of STH prevent the loss of body weight as well as excessive bacterial proliferation. Again, it remains to be seen to what extent these actions of STH will prove of value in the management of infections in man; but experiments in rats have already demonstrated the great influence of these hormones on resistance to the human type of tuberculosis. Normally, the rat is virtually resistant to acid-fast bacilli; however, by treating the animal with adequate doses of cortisone or ACTH, it can be rendered sensitive and will die of fulminating tuberculosis. If, however, the animal is treated with STH at the same time, the sensitivity to the acid-fast organisms is completely abolished and the rat is once again immune to the tubercle organism.

Quite aside from its influence on infection, STH may prove to be beneficial in other kinds of disorders. It was an observation during one of our daily rounds that cortisone, ACTH, infection, nitrogen mustard, x-ray, and chronic starvation all appeared to exert a similar type of catabolic pattern which led us to speculate on the use of STH in some of these conditions.

Preliminary experiments carried out on chronically starved rats reveal that adequate doses of STH will reduce the weight loss as compared with the normal, pair-fed controls. A significant amount of protection is also afforded by STH in experimental rats receiving large doses of x-ray irradiation. The STH-treated animals do not lose as much weight nor is there the degree of lymphatic, thymic, or splenic involution as compared with animals receiving x-ray irradiation alone.

DIETARY FACTORS

As work along these lines progressed, it became increasingly obvious that the activity of the hormones produced during stress depended largely on a variety of conditioning factors. Both the production of the stress hormones and their effect on individual target organs proved to be greatly influenced by heredity, previous exposure to stress, diet, and so forth. Thus, for instance, the production of corticotrophic hormones by the anterior pituitary gland is enhanced by a high-protein diet, while the action of the prophlogistic corticoids on most target organs is augmented by excess sodium. I should like to elaborate on the dietary factors in more detail.

We routinely produce nephrosclerosis and hypertension in the experimental animal by first sensitizing it with a unilateral nephrectomy and adding 1 per cent sodium chloride to the drinking fluid. Then, subcutaneous injections of LAP (lyophilized anterior pituitary preparation) are given, or DCA (desoxycorticosterone acetate) pellets are implanted beneath the skin. But, if the rat is kept on a diet containing less than 15 per cent protein while he is receiving LAP injections, he will suffer neither hypertension nor nephrosclerosis. A similar type of phenomenon can be observed in the rats who are treated with DCA. If they are kept on a low-sodium or salt-deficient diet during the time of their DCA treatment, no pathologic lesions will result.

Stress itself is perhaps the most effective and most common factor capable of conditioning the actions of the adaptive hormones. Thus, systemic stress augments the lympholytic, catabolic, and hyperglycemic actions of the antiphlogistic corticoids, while the salient effect of the adaptive hormones, that of modifying the course of inflammation, naturally cannot manifest itself unless some topical stressor first elicits a phlogistic response.

In the final analysis, such factors could actually determine whether exposure to stress would be met by a physiologic general adaptation syndrome or cause diseases of adaptation. Indeed, in the latter instance, these conditioning factors appear to be responsible for the selective breakdown of one or the other organ. It is felt that differences in predisposition through such factors might explain why the same kind of stress can bring about such diverse types of diseases of adaptation in different individuals.

CONCLUSIONS

There always arises the query concerning the significance and productivity of the work that has been done and is being done in the field of stress.

Undoubtedly, the most important contribution that research along these lines has made is a new approach to the treatment of disease processes: a treatment that is objectively based on simulating, and even emulating the natural healing mechanisms of the body. This approach not only promises mankind a hopeful future, but gives to each of us an insight into the underlying mechanism, both endocrine and metabolic, that take place in the condition of health and the condition of disease.

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Our Agricultural Potentiality

There need be little doubt about the ability of the agriculture of the United States to produce all the food that its people are going to be able to buy even with a continuously high level of employment. The combined judgment of the several hundred scientists in the U. S. Department of Agriculture and the forty-eight states who were consulted in the preparation of the report of the President's Materials Policy Commission was that if farmers would adopt the technology of production that is already developed, or in the process of being developed, an output at least three-fourths larger than that of the years around 1950 would result by 1975, and this with no increase in the acreage of land in farms and little or no conversion of improved land to cropland and pastureland in rotation.—*John D. Black, Ph.D., Professor of Economics, Harvard University Graduate School of Public Administration, speaking before the National Food and Nutrition Institute in Washington, D. C., on December 8, 1952.*

Iron Requirements of Children[1]

FRANCES A. JOHNSTON, Ph.D.

New York State College of Home Economics and The School of Nutrition, Cornell University, Ithaca

THE first attempt to find the amount of iron required by children was made twenty-two years ago. The method employed was based on a now outmoded theory of iron metabolism and since then no satisfactory method has been proposed. In lieu of data obtained by a direct experimental method, an attempt will be made here to estimate the requirement of children from such information as is available in the literature regarding the amount required for each function for which iron is needed.

Children need iron for four purposes: maintenance, growth, the replacement of blood-loss, and storage.

FACTORS AFFECTING IRON REQUIREMENTS

For maintenance, they probably need about the same as the adult on an equal size basis. Just as does the adult, children need to replace the usual continuous day-to-day losses in urine, feces (the metabolic iron and not the food residue), skin cells sloughed off from the surface of the body, hair, nails, perspiration, saliva, tears, and nasal discharges. The total iron content of all these materials put together is small. The body holds on to iron tightly, once it has captured it. For some of these materials, values are available; for others, little information can be found. For example, values are available for the iron content per liter of the perspiration of the adult but not of children. Even if one assumed that the perspiration of children contained the same amount as that of the adult, one still would find it difficult to make an estimate of the amount of iron lost in perspiration because information regarding the volume of perspiration lost by children is lacking. From a study of the literature coupled with information obtained in our laboratory an estimate of about 0.3 to 0.4 mg. iron (Table 1) has been made for the amount lost in all of these materials together, possibly the smaller amount by the younger children.

Added to the need for maintenance is a need for iron for growth which involves an increase in blood volume, muscle, and other tissues. Thus far no one has developed an experimental method for investigating the requirement for growth. The only way at present to find the amount required is to estimate the needs from increases in weight and blood volume. An estimate of this sort has been made by Heath and Patek (1) of the Harvard Medical School: a boy of five years of age needs 0.2 mg. per day and a boy of ten years needs 0.4 mg. (Table 1).

Children, and all others for that matter, need to replace the iron lost when blood is lost. Blood is high in iron content: the loss of 1 ml. blood entails the large loss of 0.4 mg. iron. Children frequently incur cuts, scratches, and nosebleeds; they have tonsillectomies. For most children, the loss of blood averaged to a daily basis would probably not be large, but the loss would vary widely from time to time. The estimation or the establishment of a specific figure to cover it is impossible because the loss is so unpredictable.

STORAGE NEEDS

Finally comes the question of storage. The amount an individual needs to store depends upon unknown conditions he will meet in adult life. Will he need stores for periods when his diet is deficient in iron? Will he develop some condition which interferes with the normal absorption of iron? How much will he need to replace blood-loss?

In the case of a woman, how much will she require to cover the needs of pregnancy and lactation? How much can she accumulate at the time and how much should she store in advance?

All these needs are unpredictable. About the only basis for calculating the amount which should be stored during childhood is to estimate the amount of iron needed to build stores as large as are normally found in healthy adults. Here, again, we meet problems. Estimates of the iron store of the adult differ. They are different because they have been determined by different methods and because they have been based on few subjects about whom frequently too little is known to judge whether the stores are normal. They differ, too, because young adults have smaller stores than older ones (2) and men have more than women (2). Among the esti-

[1] Presented at the 35th Annual Meeting of The American Dietetic Association in Minneapolis, on October 24, 1952.

mates in the literature, one of the high ones—about 1300 mg. (1320 mg.) for an adult man—has been made by Heath and Patek (1). This estimate will be used here in an effort to set the requirement sufficiently high.

If "childhood" is defined as beginning at two years of age, the stores at that age must be subtracted from the stores of the adult to find the amount that should be stored during childhood. Stored iron is deposited in various places in the body. The liver is an important storage depot. Ramage *et al.* (3) found the mean iron content of the livers of children of the ages of thirteen through twenty-four months to be 33.6 mg.

Another large storage depot is the red bone marrow where the red cells are manufactured. Iron is deposited there to be at hand for the synthesis of new red cells. Some workers estimate that in the case of the adult, the bone marrow contains almost as much iron as the liver. To determine the amount is difficult and has never been done with any exactitude. The bone marrow of children two years of age probably contains more iron in relation to the amount in the liver than does the bone marrow of the adult because the liver stores of the two-year-old are relatively low and the amount of red bone marrow relatively large. Children are not only replacing worn-out red cells but adding new red cells for an increasing blood volume. Since iron is stored in the spleen and elsewhere, probably the total body store is not less than three times the amount in the liver or about 100 mg.

The difference between the estimated store of the adult of about 1300 mg. and the store of the two-year-old of 100 mg. is 1200 mg. This iron need not be stored evenly from year to year. Probably children from two to six years of age should not be expected to store as much as older children because they eat a smaller volume of food. Probably adolescent girls should not be expected to store any iron because their current requirements are high. If children were to store one-eighth of the total amount between the ages of two and six years, they would need to store 0.1 mg. a day (Table 1). If girls were to store three-fourths of the total amount between the ages of six and twelve years, they would need to store 0.4 mg. per day.

TOTAL NEEDS

Now let us add all the needs together to find the total amount children need to absorb. The total at the age of five years is 0.6 mg. daily for boys and 0.7 mg. for girls, and at the age of ten is 1.0 mg. for boys and 1.3 for girls (Table 1). To this should be added an unknown allowance for a blood-loss which is unpredictable.

IRON ABSORPTION

These figures for the amount of iron which should, ideally, be absorbed are not enough for the dietitian. She must know how much iron the food should contain to allow the absorption of these amounts. Only a small percentage of the iron of food is absorbed. Therefore, the next logical step is to consider what percentage of iron is absorbed by children. Darby *et al.* (4) studied a large group of school children in Nashville, Tennessee, who were living on their usual home diets. They found that children seven through ten years of age absorbed from 8 to 17 per cent of iron from a dose of the radioactive metal. The lower percentages were found in the younger years.

Six groups of workers have carried out balance experiments. Three of these made their studies at a time when short periods were considered adequate. These studies were important in the development of methods but will not be cited here. In a balance experiment the research worker determines the amount of iron in the food and subtracts from it the amount of iron in the urine and stools in order to find the amount retained by the body. Values for retention can be converted into values for absorption by correcting for the amount lost in the urine and the amounts of metabolic iron in the stools. The iron content of the urine has been studied by a number of workers. While some evidence exists regarding the amount of metabolic iron, it is not well substantiated. A correction of 0.3 mg. for the two together will be used here.

The percentage of absorption found by the three groups of workers varies over the wide range of from 8 to 28 per cent (Table 2), which is not surprising in view of all the factors which can cause variation in absorption. The variation within each group of children was also wide. For purposes of calculation, let us accept 10 per cent absorption as an average for children up to about eight years of age and 15 per cent for older children. Let us choose these percentages, not because they are any more reliable than others, but because by using them we arrive at the highest possible required intake.

ESTIMATED INTAKE REQUIREMENTS

When these percentages are applied to the previous estimate (Table 1) of the amount of iron which should be absorbed, calculation shows that at five years of age food should provide 6 mg. iron per day for boys and 7 mg. for girls (Table 1). At ten years of age, it should provide 6.7 mg. for boys and 8.7 mg. for girls. These figures are not sufficiently accurate to retain a fraction of a milligram, so the last two figures should be raised to 7 and 9 mg. respectively. An allowance for blood-loss has not been included.

This estimated intake is somewhat lower than the intake recommended by the Food and Nutrition Board of the National Research Council (Table 1), but if it were augmented by an allowance for the replacement of iron lost in blood, the two estimates would be similar. The object in presenting this estimate is not to arrive at one which is an improvement

TABLE 1

Iron requirement of children

FUNCTION	5 YEARS OF AGE		10 YEARS OF AGE	
	Boys	Girls	Boys	Girls
	mg./day	*mg./day*	*mg./day*	*mg./day*
Growth	0.2	0.3	0.4	0.5
Maintenance	0.3	0.3	0.4	0.4
Storage	0.1	0.1	0.2	0.4
Total to absorb	0.6	0.7	1.0	1.3
Food-iron required	6.0	7.0	7.0	9.0
National Research Council allowance	8.0	8.0	10.0	10.0

TABLE 2

Iron absorption by children

INVESTIGATOR	AGE	IRON	
		Intake	Absorbed*
	yr.	*mg./day*	*%*
Ascham (5)	4–6	10.67	13
Porter (6)	3 and 5	5.64	27
Macy (7)	4 and 5	7.80	13
Macy (7)	6–10	9.30	18
Darby *et al.* (4)	7–11	—	8–17

* Calculated from values for retention to which 0.3 mg. has been added except for the experiment by Darby *et al.* (4). Since the iron content of the urine was not subtracted by Ascham (5) in obtaining the value for retention, a different correction figure was used in that case.

on the National Research Council allowance but to show the factors involved, the relative size of the amount of iron needed for each purpose, and the inadequacies of the information on which requirement figures must be based. Any present estimate could be changed tomorrow if new evidence came to light that supplied more reliable information. There is need for much research.

Approaches to a solution of this problem other than the one I have just outlined could be applied. One might, for instance, use the three balance studies to which reference has been made in another way. One might calculate the amount that should be retained and compare it to the amount the subjects actually did retain on the intakes used. This comparison has been made. The mean intake (Table 2) used in each study proved to be sufficient except for the six-to-ten-year group studied by Macy (7). In that group, the children six years old retained very little iron, but six children seven to ten years of age retained sufficient amounts.

Another way of approaching a study of the needs of elementary school children has been made by Johnston and Roberts (8). A large group of children at Mooseheart, who had been living for two years or more on a daily intake of 11 mg. iron, were found to have satisfactory hemoglobin levels. This indicated that 11 mg. was sufficient dietary iron but supplied no information as to whether less would have met the needs or whether sufficient iron was being retained for building stores. This is the only experimental study of the iron requirement of children in which a method has been used which is based on the present theory of iron metabolism. The method has, however, so many limitations that it is not very satisfactory.

NEEDS OF ADOLESCENTS

Thus far the needs of adolescent girls have not been considered. They are growing rapidly and have an additional need which is a large one, the need for iron to cover menstrual losses. Recently six girls, thirteen and fourteen years of age, were studied in our laboratory (9). On a daily intake of 11.7 mg. iron, they retained enough to cover their needs. Four of the six girls retained so much that they could have covered an additional loss of blood or could have stored some iron. The largest girl in the group had an intake of 13 mg., a little above that of the others because she consumed more of the foods allowed *ad libitum*. Despite an unusually large menstrual loss, she retained sufficient iron. We concluded that 13 mg. iron is probably enough for most adolescent girls. This conclusion was based on one experiment that involved only six subjects and cannot, therefore, be considered final. Probably the National Research Council allowance of 15 mg. is higher than necessary.

Little attention needs to be given to the requirement of adolescent boys. Their needs for growth are high, but they consume such a large quantity of food that they are almost sure to obtain enough for their current iron needs as well as some to store.

HEMOGLOBIN AS CRITERION FOR IRON DEFICIENCY

Are there many children in the United States whose diets are deficient in iron? To answer this question, some physiologic criterion should be used. The one in most common use is the hemoglobin level. This is not altogether satisfactory because the concentration of hemoglobin may be lowered by deficiencies other than that of iron. In adults, hemoglobin levels are often lowered by blood-loss rather than by a nutritional deficiency of any kind. In children, however, the cause is more apt to be nutritional. Therefore, while a low hemoglobin level in children does not necessarily mean an iron deficiency exists, it gives some estimate of the number of cases where an iron deficiency may exist.

Surveys of large groups of children show few cases of hypochromic microcytic anemia (the type of anemia which may be caused by an iron deficiency) among elementary school children. In studies of grade-school children in Pennsylvania (10), in Louisiana (11), in Michigan (12), and in North Carolina

(13), only about 2 or 3 per cent of the children were found to have hemoglobin levels of less than 11 gm. per 100 ml. blood. While this is the usual picture, there are exceptions. A higher incidence of anemia is sometimes found among colored children. In a small industrial city in Pennsylvania, Mack *et al.* (10) found an incidence of 57 per cent after a long-continued economic depression. Other exceptions could be cited. This usual incidence of 2 or 3 per cent of anemia among elementary school children would be increased if the line were drawn higher, at 12 gm. hemoglobin, for instance, instead of 11. While a concentration between 11 and 12 gm. would not be characterized as anemia by most hematologists, one would anticipate finding 12 gm. or more among children in optimal health, at least beyond eight years of age.

For children below the elementary school years, in the age range of two to six years, the incidence of hypochromic microcytic anemia is higher, and for children above that age the incidence is higher in the case of adolescent girls but lower for adolescent boys, among whom anemia is rarely found, and when it is found is usually due to causes other than iron deficiency.

A satisfactory hemoglobin level tells only that the diet is adequate for current needs but nothing about whether enough iron is being stored to build up a safe reserve for adulthood.

As time goes on there may be a reduction in the incidence of anemia in the United States because of the addition of iron to bread and other cereal products. Undoubtedly this iron increases the total iron content of the diet, but whether the iron is well absorbed is a question which needs investigation. There are three salts commonly used in enrichment; higher percentages of iron may be absorbed from some of them than from others.

One occasionally hears the statement made that the need for iron is so small that it will be supplied by any normal diet and we need not worry about it. This is probably true for adult men, adolescent boys, and older women. It may be true for elementary school children for current needs, but it does not take into account the fact that they should be building up iron stores for the future. In my opinion, attention should be given to the iron content of diets for infants, preschool children, elementary school children, adolescent girls, and a certain percentage of women in the child-bearing years whose needs are relatively larger than those of other women in the same age range.

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Committee on Low Sodium Diets

At the spring meeting of the Food and Nutrition Board in Washington, Dr. C. S. Davidson, Chairman, reported that the ad hoc Committee on Low Sodium Diets, of which Corinne Robinson, A.D.A. Diet Therapy Section Chairman, is a member, is coordinating its work with that of the Council on Foods and Nutrition of the American Medical Association.

Analyses of foods supposed to be low in sodium are progressing relatively rapidly. This means that more and more low-sodium foods are becoming available and more and more patients will have a diet known to be low in sodium. This will lead to some complications, unless education is available to physicians and to laymen, as the last Committee report pointed out. At that time, it was emphasized that a low-sodium diet may be an important therapeutic measure, but is not without danger and must be used under the direction of someone who understands the possible complications and contraindications.

The Committee plans to investigate the dietetic significance of the increased incidence of food from which sodium has been specifically removed. This processing frequently involves the removal of other nutrients, especially water-soluble vitamins. While these special foods may have therapeutic value, the accompanying risks should be clearly recognized.

Amino Acid Excretion on Different Protein Intakes[1]

MARION A. WHARTON, Ph.D.,[2] and MARY BROWN PATTON, Ph.D.

Ohio Agricultural Experiment Station, Columbus

RELATIVELY little information is available regarding the urinary excretion of amino acids of women as compared to their intakes. Mertz *et al.* (1) explained the negative nitrogen balances for older women receiving protein considerably greater than minimum requirements on the basis of limiting intakes of certain amino acids, especially methionine. Steele *et al.* (2) determined the excretion of sixteen amino acids in the urine of four college women who ingested diets low in nitrogen which contained either soy beans or eggs as the source of protein. They reported that the amount of any amino acid excreted was unchanged by alternating the ingestion of these two sources of proteins.

A previous study in this laboratory afforded data on the nitrogen intake and balances and certain amino acid intakes for women receiving dietaries that varied in protein content (3). Therefore, it was considered advisable to compare the total and per unit weight urinary excretions of arginine, histidine, isoleucine, leucine, lysine, phenylalanine, threonine, and valine for the two groups of nine women, each receiving a different level of protein.

EXPERIMENTAL PROCEDURE

The subjects, the diets, the intake of amino acids, the nitrogen intake and balance, general procedures of preparation of the food and urine samples, and the assay methods have been described previously (3). Recoveries of the eight amino acids added to the urine before hydrolysis were determined.

From figures on ninety-nine nitrogen balances, eighteen subjects were chosen according to their nitrogen intake per kilogram of body weight and divided into two groups of nine each. Group I received an average of 148.0 mg. nitrogen per kilogram and Group II, 196.0 mg.

Statistical analyses were done under the supervision of Dr. D. R. Whitney, Statistics Laboratory, The Ohio State University. Fisher's "t" test was used to determine significance of differences between the two groups of (a) nitrogen intakes; (b) nitrogen balances; (c) individual amino acid intakes; and (d) urinary excretion of the individual amino acids. The standard error of the mean was calculated for all averages.

RESULTS AND DISCUSSION

The average recoveries of the amino acids added to the urine before hydrolysis were: arginine, 111 per cent; histidine, 106; isoleucine, 93; leucine, 107; lysine, 95; phenylalanine, 102; threonine, 98; and valine, 105.

In Table 1 are presented the individual data of nitrogen intake and balance on the basis of weight and the total urinary excretion of arginine, histidine, isoleucine, leucine, lysine, phenylalanine, threonine, and valine. In Group I, the average nitrogen intake was 148.0 mg. per kilogram and in Group II, 196.0 mg. These levels were significantly different (P.01) as also was the difference in average nitrogen balances for these groups (+5.12 mg. and +32.17 mg. per kilogram, respectively) (4). A comparison of the total daily urinary excretion of certain amino acids for these groups of women consuming different levels of protein would add to the meager amount of information now available concerning total urinary excretion. The differences in average excretion of the eight amino acids in the two groups were very small (Table 1) and were found to be non-significant. However, there were great individual variations, especially in histidine; in Group I, the range was 91.6 to 675.6 mg. per day, and in Group II, 119.7 to 265.1 mg. Lysine also presented great individual variation; in Group I, the range was from 41.45 to 147.78 mg. per day; and in Group II, from 39.81 to 152.92 mg. Arginine and phenylalanine excretions presented the least individual variations. Similar variability between subjects has been reported by others (2, 5–7).

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[2] Present address: School of Home Economics, North Dakota State College, Fargo.

TABLE 1

Nitrogen intake, balance, and urinary excretion of certain amino acids for eighteen women

SUBJECT	AGE	WEIGHT	NITROGEN		TOTAL URINARY EXCRETION							
			Intake	Balance	Arginine	Histidine	Isoleucine	Leucine	Lysine	Phenyl-alanine	Threonine	Valine
Group I												
	yr.	*kg.*	*mg./kg.*	*mg./kg.*	*mg./day*	*mg./day*	*mg./day*	*mg./day*	*mg./day*	*mg./day*	*mg./day*	*mg./day*
P. R.	20	63.1	132.8	+3.96	22.62	120.2	5.07	23.00	54.48	19.57	37.02	26.07
O. D.	21	65.8	142.9	+1.82	30.82	675.6	5.72	23.21	69.48	19.19	47.89	28.14
M. W.	21	69.8	143.8	−1.00	21.99	94.8	5.66	19.87	44.87	14.22	33.73	26.87
T. K.	38	67.2	145.8	+1.64	18.97	127.8	7.73	20.46	41.45	16.82	35.40	28.62
R. J.	23	56.2	149.1	−2.31	21.98	187.8	15.48	16.36	56.97	21.26	81.53	12.24
J. M.	22	75.5	150.7	+24.37	21.23	124.7	16.79	18.40	65.29	22.84	60.74	22.67
L. R.	19	60.8	154.9	+6.41	29.95	91.6	31.06	46.51	147.78	24.14	97.27	46.99
R. S.	22	53.8	155.8	+12.27	19.85	244.5	14.62	16.35	66.38	18.94	88.03	34.55
L. Y.	20	64.2	156.4	−1.09	25.69	152.8	10.20	37.55	75.12	17.03	76.85	16.43
Average...		64.0	148.0	+5.12	23.68	202.1	12.48	24.63	69.09	19.33	62.05	26.95
Group II												
R. S.	19	52.6	183.7	+17.87	23.02	220.3	15.58	21.52	69.50	23.37	83.09	31.69
D. S. T.	22	56.2	187.2	+25.09	24.34	174.4	20.46	40.56	152.92	18.74	106.32	44.30
E. H.	41	51.2	188.7	+26.95	29.77	192.5	24.19	33.47	148.09	22.04	86.49	34.86
M. R.	20	55.3	190.2	+28.93	18.56	147.7	12.99	22.92	63.10	16.58	48.90	17.40
D. S.	20	53.4	200.4	+44.57	20.10	114.8	5.46	16.51	44.01	16.19	33.75	16.11
L. Y.	19	62.8	201.6	+41.24	30.94	169.7	5.04	22.27	65.65	17.88	44.17	28.25
M. WA.	23	62.7	201.9	+56.14	26.48	121.2	9.37	18.02	53.08	13.17	43.39	28.69
M. WH.	20	52.3	204.6	+34.80	20.11	265.1	7.86	20.32	39.81	21.23	51.68	34.62
M. L.	19	50.8	205.9	+13.98	23.37	119.7	14.23	26.01	87.90	12.41	68.20	19.21
Average...		55.3	196.0	+32.17	24.08	169.5	12.80	24.62	80.45	17.96	62.89	28.35

The total urinary excretions of isoleucine were lower than that reported for men by Steele *et al.* (5) and were the lowest of the amino acids studied. The urinary excretions in decreasing order were: histidine, lysine, threonine, valine, leucine, arginine, phenylalanine, and isoleucine.

Table 2 presents the averages of total and per-kilogram daily ingestion and excretion of each amino acid for each group as well as the urinary excretion calculated as percentage of the dietary intake.

Even though there were significant differences in both the total nitrogen intakes and balances (P.01) for these groups, only the total intakes of leucine, lysine, and arginine were significantly different (P.05). However, when these amino acids were studied on the basis of the subject's weight, arginine, histidine, isoleucine, leucine, lysine, phenylalanine, and valine were significantly different (P.01), and threonine was highly significant (P.05).

Neither the total urinary excretion nor the excretion on the basis of weight was significantly different between the two groups for any of the amino acids studied. Thus it would appear that the urinary excretion was independent of the intake within the limits of intake studied. Woodson and co-workers (7) and Steele *et al.* (5) were also unable to show any direct relationship between the urinary excretion of most of the amino acids and their dietary intake.

The urinary excretion expressed as percentage of intake was very similar for the two groups. The excretions expressed in decreasing percentages were: histidine, threonine, lysine, valine, phenylalanine, arginine, leucine, and isoleucine. These excretions were similar to those found by Steele *et al.* (5) for men receiving 100 gm. protein, except that lysine was considerably higher.

SUMMARY

Observations of the urinary excretion of arginine, histidine, isoleucine, leucine, lysine, phenylalanine, threonine, and valine were made on two groups of women. The first group of nine women received, from foods common to the American dietary, approximately 148 mg. nitrogen per kilogram body weight and the second group, 196 mg.

The data on the individual urinary excretions of each amino acid with the individual nitrogen intakes and balances on the basis of body weight are given. Also, the averages of the amino acid intakes and urinary excretion of each amino acid studied for the two groups are presented.

TABLE 2

*Average dietary intake and urinary excretion of certain amino acids**

AMINO ACID	GROUP I (Ingested 148 ± 2.5† mg. nitrogen/kg.)					GROUP II (Ingested 196 ± 2.8 mg. nitrogen/kg.)				
	Intake		Urinary excretion			Intake		Urinary excretion		
	Total	Ratio	Total	Ratio	Per cent of intake	Total	Ratio	Total	Ratio	Per cent of intake
	mg./day	*mg./kg./day*	*mg./day*	*mg./kg./day*		*mg./day*	*mg./kg.day*	*mg./day*	*mg./kg./day*	
Arginine	3113 ± 119	48.8 ± 1.7	23.7 ± 1.4	0.37 ± 0.03	0.77	3462 ± 69	62.8 ± 1.2	24.1 ± 1.4	0.44 ± 0.02	0.70
Histidine	1770 ± 56	27.8 ± 0.9	202.1 ± 61.3	3.21 ± 0.95	12.14	1968 ± 81	35.9 ± 1.9	169.5 ± 16.9	3.10 ± 0.35	8.79
Isoleucine	2913 ± 104	45.8 ± 2.0	12.5 ± 2.8	0.20 ± 0.05	0.44	3046 ± 120	55.1 ± 1.5	12.8 ± 2.2	0.24 ± 0.04	0.43
Leucine	4365 ± 85	68.6 ± 1.8	24.6 ± 3.5	0.39 ± 0.06	0.57	4919 ± 180	89.1 ± 2.2	24.6 ± 2.6	0.45 ± 0.05	0.51
Lysine	3563 ± 132	55.7 ± 1.5	69.1 ± 10.5	1.10 ± 0.18	1.96	4013 ± 131	72.7 ± 1.5	80.5 ± 14.1	1.48 ± 0.27	2.04
Phenylalanine	2443 ± 56	38.3 ± 1.0	19.3 ± 1.0	0.31 ± 0.02	0.80	2610 ± 74	47.3 ± 1.0	18.0 ± 1.3	0.33 ± 0.03	0.69
Threonine	2682 ± 107	42.1 ± 1.8	62.1 ± 8.2	1.00 ± 0.16	2.33	2839 ± 136	51.7 ± 2.9	62.9 ± 8.1	1.16 ± 0.16	2.32
Valine	3101 ± 71	48.6 ± 1.1	27.0 ± 3.4	0.43 ± 0.06	0.88	3283 ± 96	59.5 ± 1.1	28.4 ± 3.1	0.52 ± 0.06	0.87

* Each figure represents the average for nine women

† Standard error of the mean.

The average dietary intakes per kilogram of these amino acids were significantly different for the two groups of women, but the urinary excretions showed no significant differences either on the basis of total excretion or on that of body weight. Thus the data indicated that the urinary excretions of the eight amino acids studied were independent of the intakes within the limits of intakes observed.

There was great individual variation in the amounts of the eight amino acids excreted by these women. This was especially true for histidine, which, on the basis of per cent of intake, was much greater than that for the other amino acids studied.

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Uncooked Jam from Frozen Fruit

Uncooked jams from commercially frozen, fresh, and home-frozen-without-sugar red raspberries and strawberries have been developed at Purdue University. Both powdered and liquid pectin were used. These jams are of practical interest because of their ease of preparation and the continuous availability of frozen fruit, as well as their unique fresh fruit flavor.

With red raspberry jam, it was found that uncooked jam could be produced which was characterized by a bright red color, a natural fresh fruit flavor, a satisfactory consistency, and some syneresis. There was some evidence that jams made with liquid pectin were stiffer with higher concentrations of sugar than those made with powdered pectin.

Although relatively fewer experiments with frozen strawberries were conducted, a narrower range of satisfactory proportions than with red raspberries was indicated, and the proportion of pectin to fruit had to be higher.

Because the jams were not sterilized and because of comparatively low sugar concentrations, storage at room temperature was not practical. Freezer storage is recommended for longer periods, although the refrigerator was found satisfactory for periods of six weeks or less.

Enough work was also done to formulate recipes using commercially frozen and fresh peaches and cherries. With peach jam, it was necessary to add acid, which, incidentally, also prevented browning due to oxidation.

Fresh fruits which have been successfully used for uncooked jams include plums, blackberries, apricots, black raspberries, grapes, and cranberries. Recipes are available from the Department of Foods and Nutrition, Purdue University, Lafayette, Indiana.—*Abstracted from: Kramer, M. A., and Sunderlin, G.: The gelation of pectin in uncooked jam from frozen red raspberries and strawberries. J. Home Econ. 45: 243, 1953.*

Muffins Prepared from Soft Wheat Flour[1]

KARLA LONGRÉE, Ph.D.[2]

Director of Research in Institution Management, New York State College of Home Economics at Cornell University, Ithaca

CONSIDERABLE quantities of soft wheat flour are produced in the State of New York and new outlets are being sought for it. At present, soft wheat flour is cheaper than all-purpose flour and, therefore, is of interest in quantity food preparation. Information is needed on its performance when substituted for other flours and starchy thickeners, such as all-purpose flour, cake flour, and cornstarch in quantity formulas. The results of some studies have been presented previously (1, 2). Since muffins are a popular item in many food service establishments, the present investigation was carried out to determine the feasibility and the effect of substituting soft wheat flour for all-purpose flour, weight for weight, on palatability and on some physical characteristics of plain muffins and muffin variations.

In quantity food service, muffins may be held in a warmer for various lengths of time before serving. This is in contrast to the home situation where muffins are usually served fresh from the oven. Then, too, muffins prepared in quantity may be held over to the next day, reheated, and served. Therefore, it seemed of interest to study the effect of holding after baking on tenderness and other palatability characteristics of muffins made with both kinds of flour.

Muffin variations may be prepared from the plain batter by minor changes in the formula or by simply adding various ingredients to the batter. These ingredients may be dry, such as dry fruit; moist, such as frozen or canned berries; moist and sweet, such as moist fruit in combination with additional sugar; or fatty, such as cooked minced bacon. The question arose whether straight substitution of soft wheat flour for all-purpose flour was feasible and desirable for muffin variations.

For the present study, the general plan was to investigate the effect of substituting soft wheat flour for all-purpose flour on: (a) volume, shape, and crumb structure of plain muffins and muffin variations; (b) palatability scores and compressibility values of plain muffins held varying lengths of time; and (c) palatability scores of muffin variations made by additions of dry, moist, moist and sweet, and fatty ingredients to the batter of plain muffins. Raisins, blueberries, apples plus sugar, and bacon were the ingredients used in the variations.

EXPERIMENTAL PROCEDURE

The experiments were carried out in a cafeteria kitchen of the Department of Institution Management, New York State College of Home Economics. The batters were prepared from the formulas given in Table 1 in quantities sufficient for 6 doz. muffins.

Mixing and Baking. All ingredients were at room temperature when mixed. Mixing was done by hand using the modified cake method. Sugar and shortening were creamed, eggs added and mixed into the combined dry ingredients and the water added, after which mixing was continued until the dry ingredients were just moistened and the batter still had a pebbly appearance. Raisin and bacon variations were prepared by mixing the raisins or chopped bacon, respectively, with the dry ingredients. In blueberry variations, the blueberries were sprinkled on top of the batter while it was being scooped into tins. In the sugary apple muffins, part of the additional sugar was used in creaming; the apples were combined with the sugar-fat-egg mixture, and the remainder of the additional sugar was used in the topping (Formula II).

On each baking day, two 6-doz. batches of muffins, one made with soft wheat flour and one with all-purpose flour, were prepared. Two persons mixed the batters simultaneously. When replicates were prepared, the person who had worked with the all-purpose flour worked the batter containing soft wheat flour and vice versa.

The batter was scooped into tins, each with twelve wells. The wells measured $2\frac{3}{4}$ in. across the top, 2 in. across the bottom, and were $1\frac{3}{8}$ in. deep. A No. 20 scoop was used. Six tins were filled with batter made with soft wheat flour and six with batter made with all-purpose flour. The muffins were placed in random order, on decks of electric ovens maintained at 425°F. The muffins were baked for approximately 15 min. until light golden brown.

[1] Received for publication February 4, 1953.

[2] The laboratory work was done by Elaine Rose, a senior in the College of Home Economics.

TABLE 1

Muffin formulas

INGREDIENTS	FORMULA I		FORMULA II—SUGARY APPLE MUFFINS
	Plain muffins	Variations	
Sugar	14 oz.	14 oz.	18 oz.
Hydrogenated vegetable shortening	16 oz.	16 oz.	12 oz.
Frozen egg yolks*	8 oz.	8 oz.	8 oz.
Flour†	4 lb.	4 lb.	3 lb. 6 oz.
Baking powder‡	4 oz.	4 oz.	4 oz.
Salt	½ oz.	½ oz.	½ oz.
Nonfat milk solids	6½ oz.	6½ oz.	6 oz.
Water	6½ c.	6½ c.	6 c.
Raisins		½ c.	
—or blueberries, frozen solidly		1 pt.	
—or bacon, minced		1½ c.	
Apples ⁂, drained, chopped			1 pt.
Cinnamon			½ oz.
Topping			
sugar			6 oz.
cinnamon			1 tsp.

* Voltex, made of frozen egg yolks and whites, salt, and stabilizing sirup composed of dextrin, maltose, and water.

† All-purpose or New York State soft wheat; same brands were used throughout experiment.

‡ Sulphate-phosphate type.

⁂ Canned, water pack.

Treatment after Baking. From each tin an equal number of muffins was used for the various tests performed. Muffins to be used for volume determination and for observations on shape, surface texture, and crumb structure were held at room temperature for approximately 45 min.

In the study on the effect of holding after baking on palatability and compressibility, some of the muffins were held in a warmer for 15 min. and some for 60 min. The warmer was maintained at 140°F. to 144°F. In investigating the effect of holding overnight and subsequent reheating, the muffins were first held in a warmer for 15 min., then divided into two lots. One lot was tested immediately after removal from the warmer. The other lot was placed on trays, covered with a cloth, and allowed to stand in a cake cabinet until the following day, when the muffins were reheated for 5 to 7 min. in an electric oven maintained at 425°F., then tested for compressibility and judged organoleptically. The muffin variations were held in a warmer for 45 min. before scoring.

Palatability. Six qualified judges scored the products. A check-type score sheet was used. Characteristics scored were: (a) tenderness of crust and crumb, (b) cohesiveness and moisture of crumb, (c) flavor, and (d) general acceptability. Four of the judges were given a second score sheet on which to make direct comparison between the flours regarding crumb tenderness, moisture, greasiness, and general acceptability. Each treatment was the first to be judged an equal number of times.

TABLE 2

Arithmetic means of specific volumes of plain muffins and muffin variations made with soft wheat flour and all-purpose flour

TYPE OF MUFFIN	NUMBER OF BATCHES*	SPECIFIC VOLUME	
		Soft wheat muffins	All-purpose muffins
		cc./gm.	*cc./gm.*
Plain	4	2.2†	2.0†
Variations			
Raisin	2	1.9	1.9
Blueberry	2	2.0	1.9
Sugary apple	2	1.9	1.9
Bacon	2	2.0	2.0
All variations		2.0‡	1.9‡

* In each batch, volume determinations were made in duplicate.

† $t = 1.98$; d.f., 7; odds 21:1 that volumes of plain soft wheat muffins are greater than volumes of plain all-purpose muffins.

‡ $t = 0.60$; d.f., 15; odds 3:1 that volumes of all soft wheat variations are greater than volumes of all all-purpose variations.

Objective Tests. Specific volume was determined by a modification of the seed displacement method of Cathcart‡ and Cole (3). Eight muffins were used from each different lot. Compressibility measurements were made on a slice from each of seven muffins from each different lot; the procedure used by Briant and Klosterman (4) was followed. The muffins were kept warm until the test slices were removed; in preliminary tests it had been found that compressibility values increased with decreasing temperature of crumb. The Baker compressimeter described by Platt and Powers (5) was used to determine compressibility.

RESULTS

Surface Appearance, Crumb Structure, and Volume. In general, plain muffins and variations made with soft wheat flour tended to have smooth tops and a characteristic rim. The crumb structure of the soft wheat muffins was more open than that of all-purpose muffins, the cells were somewhat larger, and the cell walls thinner. The uniformity of cells was similar in muffins made with both types of flour. Mean values of volume determinations are shown in Table 2. There was a tendency for the volume of plain soft wheat muffins to be somewhat larger than that of all-purpose muffins. In the variations, this tendency was not noticeable.

Palatability of Plain Muffins. Plain muffins made with two kinds of flour and held in the warmer for

TABLE 3

Arithmetic means of subjective scores for plain muffins made with two kinds of flour and held in warmer for 15 and 60 min.

TEST	TIME HELD IN WARMER	SUBJECTIVE SCORES*			
		Tenderness of crust†	Tenderness of crumb‡	Cohesiveness§	General acceptability¶
Soft Wheat Muffins					
	min.				
1	15	2.3	3.5	2.5	3.0
2	15	3.0	3.7	2.3	3.8
Average.....		2.65	3.60	2.40	3.40
1	60	2.7	3.3	2.5	3.0
2	60	2.8	3.7	2.0	3.7
Average.....		2.75	3.50	2.25	3.35
All-Purpose Muffins					
1	15	2.0	2.5	3.0	2.2
2	15	2.5	2.7	2.7	3.3
Average.....		2.25	2.60	2.85	2.75
1	60	1.8	2.3	3.0	2.3
2	60	1.8	2.2	2.7	2.7
Average.....		1.80	2.25	2.85	2.50

* For the individual tests, each figure represents a mean of six scores.

† Possible scores: 3, crisp but tender; 2, slightly tender; and 1, tough.

‡ Possible scores: 4, very tender; 3, tender; 2, slightly tender; and 1, tough.

§ Possible scores: 3, cohesive; 2, slightly crumbly; and 1, very crumbly.

¶ Possible scores: 4, very acceptable; 3, acceptable; 2, slightly acceptable; and 1, unacceptable.

15 min. after baking scored similarly in palatability with a tendency of the soft wheat muffins for higher scores in tenderness of crust and crumb and in general acceptability and lower scores in cohesiveness (Table 3). When the two kinds of muffins held for 15 min. were compared on direct comparison sheets, the judges unanimously scored the soft wheat flour muffins as more tender of crust and crumb, less cohesive, similar in moisture and greasiness, and of greater general acceptability. Both kinds of muffins were judged pleasing in flavor.

Soft wheat muffins held for 60 min. in a warmer received palatability scores similar to those assigned to muffins held for 15 min. There was a tendency toward an increase in crumbliness with prolonged holding time. All-purpose muffins held in a warmer for 60 min. decreased in tenderness of crust and crumb and general acceptability. On direct-comparison sheets, the judges scored the soft wheat muffins as more tender of crust and crumb, less cohesive, and more acceptable than the all-purpose muffins. Soft wheat muffins tended to be slightly drier than the all-purpose muffins, which tended to be more greasy. Muffins made with both types of flour were judged to be pleasing in flavor.

TABLE 4

Arithmetic means of subjective scores for plain muffins made with two kinds of flour and held in two ways after baking

TEST	TREATMENT AFTER BAKING	SUBJECTIVE SCORES*			
		Tenderness of crust†	Tenderness of crumb‡	Cohesiveness†	General acceptability‡
Soft Wheat Muffins					
1	Held in warmer for 15 min.	2.7	3.3	2.7	3.7
2		2.8	3.5	2.7	3.5
Average...		2.75	3.40	2.70	3.60
1	Held overnight and reheated	2.0	2.8	2.7	2.9
2		2.4	3.0	2.2	3.0
Average...		2.20	2.90	2.45	2.95
All-Purpose Muffins					
1	Held in warmer for 15 min.	1.2	1.7	3.0	2.0
2		1.7	2.3	2.8	3.1
Average...		1.45	2.00	2.90	2.55
1	Held overnight and reheated	1.2	2.0	2.7	2.5
2		1.8	2.0	2.8	2.7
Average...		1.50	2.00	2.75	2.60

* For the individual tests, each figure represents a mean of six scores.

† Highest possible score is 3.

‡ Highest possible score is 4.

The means of the scores for muffins held overnight at room temperature and reheated are presented in Table 4. The scores of all muffins held for 15 min. resembled, in general, those presented in Table 3. Muffins made with both kinds of flour, when held overnight and then reheated, decreased in tenderness of crust and crumb, cohesiveness, and general acceptability. On direct-comparison sheets the judges expressed their preference of the soft wheat muffins over all-purpose muffins.

In general, it may be said that plain soft wheat muffins scored higher in palatability than all-purpose muffins; this was true for the freshly baked product as well as the muffins that were held for prolonged periods. Plain soft wheat muffins showed little change in palatability characteristics during 1-hr. holding in the warmer whereas all-purpose muffins did.

TABLE 5

Arithmetic means of subjective scores for muffin variations made with two kinds of flour and held for 45 min. in warmer

TEST	TYPE OF FLOUR	SUBJECTIVE SCORES*			
		Tenderness of crust†	Tenderness of crumb‡	Cohesiveness†	General acceptability‡
Raisin Variation					
1	soft wheat	2.3	3.0	2.7	3.3
2	soft wheat	2.9	3.2	2.9	3.5
Average. .		2.60	3.10	2.80	3.40
1	all-purpose	1.3	1.7	3.0	2.2
2	all-purpose	2.5	1.8	2.7	3.2
Average...		1.90	1.75	2.85	2.70
Blueberry Variation					
1	soft wheat	2.7	3.3	2.5	3.3
2	soft wheat	2.9	3.5	2.5	3.5
Average...		2.80	3.40	2.50	3.40
1	all-purpose	2.2	2.5	2.9	3.0
2	all-purpose	2.3	2.0	3.0	3.3
Average...		2.25	2.25	2.95	3.15
Sugary Apple Variation					
1	soft wheat	2.7	3.5	2.9	3.9
2	soft wheat	2.9	3.5	2.5	3.9
Average...		2.80	3.50	2.70	3.90
1	all-purpose	1.7	2.7	3.0	3.2
2	all-purpose	2.7	2.9	2.9	3.9
Average...		2.20	2.80	2.95	3.55
Bacon Variation					
1	soft wheat	3.0	3.0	2.7	3.5
2	soft wheat	3.0	4.0	2.5	3.5
Average...		3.00	3.50	2.60	3.50
1	all-purpose	2.0	2.5	2.9	2.9
2	all-purpose	1.8	1.8	3.0	3.0
Average...		1.90	2.15	2.95	2.95

* For the individual tests, each figure represents a mean of six scores.

† Highest possible score is 3.

‡ Highest possible score is 4.

Palatability of Muffin Variations. The scores of the variations of plain muffins involving incorporation of berries, raisins, bacon, and apples (plus additional sugar) are presented in Table 5. Without exception, soft wheat muffin variations scored considerably higher in tenderness of crust and crumb than comparable muffins made with all-purpose flour; soft wheat muffin variations scored as well or higher in general acceptability. There was a tendency for the soft wheat muffins to be slightly less cohesive than the all-purpose muffins, but in no case were they more than slightly crumbly.

Compressibility of Plain Muffins. Compressibility determinations were made on plain muffins of the same lots from which samples were drawn for palatability tests.

The length of holding times and conditions of holding these muffins have been described above under "palatability of plain muffins." The data were subjected to an analysis of variance. Variables were: kinds of flour and holding. Variations attributable to baking days were incorporated in the "error" of the experiment. The "error" was used for testing significance.

It should be remembered that high compressibility values indicate "lesser compressibility of the crumb" or "harder muffins." From the data presented in Tables 6 and 7, it may be seen that the difference in compressibility values of the muffins made with the

TABLE 6

Compressibility values of plain muffins made with two kinds of flour and held in a warmer for 15 and 60 min.*

HOLDING TREATMENT	COMPRESSIBILITY VALUES OF CRUMB	
	Soft wheat flour	All-purpose flour
	gm./3 mm.	*gm./3 mm.*
Held 15 min.	9.28	12.18
Held 60 min.	9.82	14.96

* Each figure represents the mean of two tests; in each test, compressibility values were determined on seven muffins.

TABLE 7

Analysis of variance on type of flour and holding conditions of muffins

SOURCE OF VARIATION	DEGREES OF FREEDOM	MEAN SQUARES
Flour	1	226.0*
Holding	1	38.6*
Flour × holding	1	17.6†
Error	52	4.2

* $P \leq 0.01$.

† $P \leq 0.05$.

TABLE 8

Compressibility values of plain muffins made with two kinds of flour and treated in two ways*

HOLDING TREATMENT	COMPRESSIBILITY VALUES OF CRUMB	
	Soft wheat flour	All-purpose flour
	gm./3 mm.	*gm./3 mm.*
Held 15 min. in warmer	7.75	11.07
Held overnight at room temperature, then reheated	13.32	16.86

* Each figure represents the mean of two tests; in each test, compressibility values were determined on seven muffins.

two kinds of flour was highly significant. Furthermore, muffins held for 60 min. had higher compressibility values than those held for 15 min.; the difference was highly significant. The significant interaction "flour × holding" indicates that the two flours did not change to the same extent. Compressibility values of the muffins made with all-purpose flour increased considerably more with prolonged holding than the values of muffins made with soft wheat flour.

The compressibility values of muffins, some of which were held for 15 min. and some of which were held overnight, are presented in Tables 8 and 9. Again, differences in compressibility values which can be attributed to flour were highly significant. The interaction of "flour × holding" was not significant; both types of muffins seemed to change in compressibility to a similar extent.

SUMMARY

The purpose of the present investigation was to determine the feasibility of substituting New York State soft wheat flour for all-purpose flour, weight for weight, and the effect of this substitution on palatability and some physical characteristics of plain muffins and variations, as well as the effect of holding after baking on tenderness and other palatability characteristics of muffins made with both kinds of flour.

Muffins made from soft wheat flour tended to have smoother and slightly less rounded tops than those made from all-purpose flour; the structure of the crumb was more open, the cells slightly larger, the cell walls thinner. There was a tendency for the volume of plain soft wheat muffins to be larger than that of plain all-purpose muffins. In general, soft wheat muffins were more tender of crust and crumb and slightly less cohesive than all-purpose muffins. They rated higher in general acceptability.

Ratings in palatability characteristics for plain soft wheat muffins held in a warmer for 1 hr. were similar to those for muffins held for 15 min. only. This was not true for all-purpose muffins which, after 1-hr. holding, rated lower because of decreased tenderness of crust and crumb. Soft wheat muffins held overnight and reheated rated considerably lower in palatability than those held for 1 hr. in the warmer, but they rated higher than all-purpose muffins.

Freshly baked plain muffins made from soft wheat flour, when held for 15 min. in the warmer and tested for compressibility of crumb, showed significantly lower values, thus indicating a lower resistance to compression than found in all-purpose muffins. After 1-hr. holding in a warmer, compressibility values for soft wheat muffins had increased slightly, and they were considerably higher after holding overnight. In the all-purpose muffins, compressibility values had increased considerably after 1-hr. holding.

In general, the study showed that muffins can be successfully made with soft wheat flour. It also showed that soft wheat muffins can be held more successfully than muffins made from all-purpose flour.

TABLE 9

Analysis of variance on type of flour and holding conditions of muffins

SOURCE OF VARIATION	DEGREES OF FREEDOM	MEAN SQUARES
Flour	1	164.6*
Holding	1	451.5*
Flour × holding	1	0.2
Error	52	0.3

* $P \leq 0.01$.

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A dry vinegar which can be reconstituted in water of any temperature and which does not freeze has been developed by the Quartermaster Food and Container Institute for the Armed Services. Other new food items are: pre-fried bacon, canned pecan roll, dry whipping cream, dehydrated cheese, dry coffee cream, and dehydrated barbecue sauce. These products were shown at a Technological Aids to Industry Exhibit staged by the U. S. Department of Commerce.

Noncaloric Sweeteners in Canned Fruits[1]

E. E. ANDERSON, Ph.D., W. B. ESSELEN, Ph.D., and C. R. FELLERS, Ph.D.

Department of Food Technology, University of Massachusetts, Amherst

AN increased awareness of the problems associated with diabetes and obesity has led to rapid development in the production of the so-called "dietetic" foods. That there is good reason for this development may be gathered from the fact that there are in the United States more than one million persons with diabetes being treated clinically, and an estimated additional two or three million individuals who are either untreated or who represent subclinical cases.

The observation has also been made that caloric overnutrition is the most prevalent American nutritional disease. It is estimated that thirty million persons in the United States are at least 10 per cent overweight. Of these, fifteen million are 20 per cent overweight.

In view of the potential demand by these two groups for palatable low-calorie foods, an investigation of the acceptability of frozen and processed fruits prepared with noncaloric (nonsucrose) sweeteners appeared warranted. Considering the taste angle first, the major purpose was to determine the acceptability of the two most commonly used noncaloric sweeteners when compared to (a) ordinary sucrose and (b) the water-packed fruit.

Until recently an individual wishing to prepare frozen or canned fruits without added sugar found it necessary to put them up either as a water pack or as a water pack sweetened with saccharin. This observation is in keeping with that of Richards *et al.* (1) who reported that since its discovery in 1897, saccharin has been the major sugar substitute used by persons with diabetes as well as by persons who are on low-calorie diets.

However, the use of saccharin as a sweetening agent, especially in canned fruit packs, has led to much discussion. Serger (2) stated that at 100°C. (212°F.) saccharin is not decomposed nor does it give rise to bitter decomposition products in noticeable amounts. Adam (3) also was of the opinion that saccharin could be used without the introduction of foreign flavors to increase the sweetness of a low-Brix sirup[2] in canned fruits. Similarly, in studies on the hydrolytic stability of saccharin, De Garmo *et al.* (4) reported that for all practical purposes saccharin in aqueous buffered solutions of *p*H 3.3, 7.0, and 8.0 was unaffected by heating for 1 hr. at temperatures of 100°, 125°, and 150°C. (212°, 257°, and 302°F.) Dietetic canned fruits which are artificially sweetened have recently appeared on the market.

On the other hand, Traegel (5) found that when more than 10 per cent of the added sugar in boiled apples was replaced by saccharin, an unpleasant taste resulted. Weast (6) also reported that saccharin in concentrations greater than 0.01 per cent left a bitter aftertaste and that for some individuals bitterness could be detected in much smaller amounts. He noted that when fruits or fruit juices were sweetened with saccharin, they became bitter upon standing or cooking. However, Weast claimed that the addition of pectin with saccharin to frozen fruits overcame these objections. Weast (7) also claimed a similar action for pectin when used with saccharin in canned fruits.

Recently, Richards *et al.* (1) described a new noncaloric sweetener, cyclohexyl sulfamate sodium (Sucaryl sodium), claiming that it possesses a clean, sweet taste in concentrations up to 0.8 per cent and that it is resistant to boiling under acid or alkaline conditions ordinarily present in the preparation of foodstuffs.

On the basis of equivalent sweetness, Sucaryl sodium is about 30 times (1) and saccharin about 300 to 500 times sweeter (8) than sucrose. Sucaryl is also available as the calcium salt.

EXPERIMENTAL PROCEDURES

During the past several seasons, packs of raspberries, sweet cherries, blueberries, freestone peaches, pears, and rhubarb were packed in either 1-pt. or

[1] Contribution No. 857 of the Massachusetts Agricultural Experiment Station. Received for publication October 8, 1952.

[2] Brix is a term used in defining the concentration of a sugar solution. It corresponds to the per cent of sugar in a solution, i.e., a 20° Brix solution is a solution of 80 per cent water and 20 per cent sugar.

½-pt. home-canning jars as recommended by Fellers, Esselen, and Cole (9). The following four packing media were used in each of the above fruit packs: (a) 30° Brix sucrose sirup (control); (b) water pack; (c) and (d) saccharin[3] and Sucaryl sodium[4] sirups[5] equivalent in sweetness to the sucrose sirup. In the case of raspberries, additional packs were put up using a 60° Brix sucrose sirup and Sucaryl and saccharin sirups of equivalent sweetness.

Considering saccharin as 400 times sweeter and Sucaryl sodium as 30 times sweeter than sucrose, sirups of equivalent sweetness were prepared on a volume basis. Thus, dissolving 600 gm. sucrose in 1400 gm. water yielded 1770 ml. 30° Brix sucrose sirup. Therefore, 1.5 gm. saccharin and 20 gm. Sucaryl sodium were added to sufficient water to give final sirup volumes of 1770 ml. Thus, if a ½-pt. jar took 50 ml. sirup, it would receive the same relative amount of sweetness from each 50-ml. aliquot of the sirups.

To minimize surface discoloration of the fruits and possible attendant off-flavors, ascorbic acid was added to each sirup in amounts sufficient to provide approximately 150 mg. per pint jar.

In some fruits, preliminary studies were also carried out incorporating pectin[6], sodium carboxymethylcellulose,[7] and a seaweed extractive[8] as thickening agents in the Sucaryl and saccharin sirups in an attempt to have their viscosities more closely approximate those of the sucrose sirups.

After processing, the packs were stored at room temperature and examined at intervals up to one year by a taste panel consisting of ten members of the Food Technology Department.

All panel members were qualified in that they had proved themselves on previous taste panels and were well versed in taste panel techniques. Smokers on the panel were asked to refrain from smoking for at least 1 hr. prior to tasting.

At the time of examination, the taste panel was asked to rate the packs in order of preference, to note the presence of and describe any off-flavors, and to rate the viscosity of the sirups. Results were obtained by the so-called "paired comparison" technique in which two samples were presented and the member was asked to select the one preferred. Each listed the coded samples of the fruit pack under consideration in the order of his personal preference; i.e., #1 was the most acceptable; #2 was second; #3 was third; and #4 was least acceptable.

[3] Saccharin was Merck's U.S.P. grade powder.

[4] Sucaryl sodium was supplied in the form of a white powder by the Abbott Laboratories, North Chicago, Illinois.

[5] The term "sirup" is used in this paper for solutions of Sucaryl sodium and saccharin, although not strictly correct.

[6] Exchange Citrus Pectin Rapid Set No. 436, 150 grade.

[7] DuPont's sodium carboxymethylcellulose Grade 12.

[8] "Krim-Kold," supplied by the Seaplant Chemical Corporation, New Bedford, Massachusetts.

Readings of soluble solids were also made at this time by means of an Abbé refractometer.

RESULTS

Canned Blueberries. The results of the taste panel indicated that although little difference in acceptability existed between the sucrose and Sucaryl packs, the latter was preferred by the greatest number of judges. Next in order of preference came the blueberries sweetened with saccharin, which were rated as being far superior to the water pack.

Canned Raspberries. There was little difference in the relative acceptability of the sucrose, Sucaryl, and saccharin packs. In the 1950 pack, raspberries packed in sucrose sirups were rated the best; however, in the 1951 pack, the panel unanimously preferred the Sucaryl pack and rated the sucrose and saccharin packs of equal acceptability. Water-packed raspberries were rated a poor last.

Canned Sweet Cherries. Those packed in saccharin and sucrose sirups received the highest ratings, while the Sucaryl pack was rated as only slightly less acceptable. The water packs again were found to be the least desirable.

Canned Pears. Again, little difference was found in the relative acceptability of pears canned in sirups sweetened with Sucaryl, saccharin, or sucrose. Of the three, however, the sucrose pack was rated as being somewhat more preferable, but the Sucaryl and saccharin packs were considered far more preferable than the water pack.

Canned Peaches. Preference was equally divided between those peaches packed in sirups sweetened with saccharin and those sweetened with sucrose. Sucaryl-sweetened peaches were rated as the third choice in every case, and the water pack again a poor last.

Canned Rhubarb. Rhubarb packed in sucrose-sweetened sirup was unanimously chosen as being the most acceptable, with second place again being evenly divided between the Sucaryl and saccharin packs. The water packs again were rated as being by far the least desirable.

DISCUSSION

The results of this experimental work indicate that acceptable canned fruits may be packed for dietetic purposes, wherein the usual packing medium (sucrose sirup) is replaced by saccharin or Sucaryl sirups of equivalent sweetness. In most of the taste panel evaluations, the members observed that there was little difference in the acceptability of the same fruit canned with the various sweetening agents. However, in rating each of the six fruit packs on the basis of the preferred sweetening medium, the sucrose pack was preferred for pears and rhubarb; the Sucaryl pack, for blueberries; either the saccharin or sucrose pack, for sweet cherries and

peaches; and either the Sucaryl or sucrose pack, for raspberries. The important point, however, was not so much the small differences in acceptability of the various fruits put up with the various sweetening agents as it was the unanimous selection of *all* sweetened packs over the water packs. Additional and much more extensive packs will be prepared, and statistical evaluation of these data will serve to rate the relative acceptability more conclusively.

At the levels employed, the panel members were not able to detect any significant off-flavors associated with the use of Sucaryl or saccharin. Thus, if approximately 170 gm. fruit and 85 ml. 30° Brix sucrose sirup were used to fill a ½-pt. jar, the incorporation of Sucaryl and saccharin sirups of equivalent sweetness would result in an over-all concentration of 0.21 per cent Sucaryl and 0.016 per cent saccharin. Saccharin and Sucaryl sirups of greater equivalent sweetness (i.e., comparable to the 60° Brix sucrose sirups used in raspberries) would have doubled these concentrations. Thus, although Weast (6) claimed that saccharin in concentrations greater than 0.01 per cent left a bitter taste, this was not supported by the findings of the present study. The fact that a Sucaryl sirup (about 0.4 per cent concentration) equivalent in sweetness to a 60° Brix sucrose sirup did not give rise to off-flavors is in keeping with the report of Richards *et al.* (1) who claimed that Sucaryl sodium had a clean, sweet taste in concentrations up to 0.8 per cent.

The unanimous selection of the Sucaryl- and saccharin-sweetened packs over the water packs in each of the six experimental fruit packs would indicate that canned dietetic fruit packs (water packs) presently on the market would enjoy a much greater consumer appeal if packed with noncaloric sweeteners.

Furthermore, there were no observable differences in color of the fruits put up with the different sweetening agents or with water as long as sufficient ascorbic acid (150 mg. per pint jar) was added to the sirup prior to filling and sealing the jar.

The increased appeal of the sweetened packs should not only be of value to persons with diabetes who otherwise are consuming fruits in the form of less flavorful water packs, but also to the individual who is trying to reduce. In the latter case, as is illustrated in Table 1, the total caloric value contributed by the soluble solids of the Sucaryl- and saccharin-sweetened packs, when put up in sirups equivalent in sweetness to 30° Brix sucrose sirup, averaged only 50 per cent that of the sucrose packs. When 50° or 60° Brix sucrose sirups were used, the caloric value was between three and four times that of packs sweetened to an equivalent level with Sucaryl or saccharin.

Pectin and sodium carboxymethylcellulose in sirup concentrations of 0.5 to 1 per cent and the seaweed extractive in concentrations of 0.25 to 0.50 per cent when used with the noncaloric sweeteners imparted sufficient viscosity to these sirups so that at the time of examination they were almost indistinguishable in this respect from the sucrose packs. The value of incorporating these thickeners was more noticeable in the packs of pears and peaches

TABLE 1

Average soluble solids content and caloric value of fruits packed in sucrose, water, and Sucaryl and saccharin sirups

PRODUCT	PACKING MEDIUM	AVERAGE SOLUBLE SOLIDS (carbohydrate)	CALORIES PER 100 GM.
		%	
Blueberries	30° Brix sucrose	18.4	73.6
Blueberries	Sucaryl sodium ≏ 30° Brix sucrose	8.1	32.4
Blueberries	saccharin ≏ 30° Brix sucrose	7.7	30.8
Blueberries	water	7.6	30.4
Sweet cherries	30° Brix sucrose	19.3	77.2
Sweet cherries	Sucaryl sodium ≏ 30° Brix sucrose	9.0	36.0
Sweet cherries	saccharin ≏ 30° Brix sucrose	8.8	35.2
Sweet cherries	water	8.3	33.2
Peaches	30° Brix sucrose	16.5	66.0
Peaches	Sucaryl sodium ≏ 30° Brix sucrose	7.8	31.2
Peaches	saccharin ≏ 30° Brix sucrose	7.7	30.8
Peaches	water	7.3	28.2
Pears	30° Brix sucrose	16.5	66.0
Pears	50° Brix sucrose	22.5	90.0
Pears	Sucaryl sodium. ≏ 30° Brix sucrose	8.2	32.8
Pears	saccharin ≏ 30° Brix sucrose	8.0	32.0
Pears	water	7.9	31.6
Raspberries	30° Brix sucrose	16.8	68.2
Raspberries	60° Brix sucrose	27.0	108.0
Raspberries	Sucaryl sodium ≏ 30° Brix sucrose	6.8	27.2
Raspberries	Sucaryl sodium ≏ 60° Brix sucrose	6.9	27.6
Raspberries	saccharin ≏ 60° Brix sucrose	6.3	25.2
Raspberries	water	5.9	23.6
Rhubarb	30° Brix sucrose	17.2	68.8
Rhubarb	Sucaryl sodium ≏ 30° Brix sucrose	2.8	11.2
Rhubarb	saccharin ≏ 30° Brix sucrose	2.2	8.8
Rhubarb	water	2.0	8.0

than in the other fruit packs. At the above concentrations of thickness there were no attendant off-flavors resulting from their incorporation in the saccharin and Sucaryl sirups.

SUMMARY

There was little difference in the acceptability of canned peaches, pears, blueberries, raspberries, sweet cherries, and rhubarb sweetened with either sucrose, Sucaryl sodium, or saccharin. In all examinations, the various sweetened packs were unanimously chosen as more desirable than the water-packed fruit.

The incorporation of varying amounts of pectin, sodium carboxymethylcellulose, and a seaweed extractive in the Sucaryl- and saccharin-sweetened sirups resulted in increasing their viscosities to levels resembling those of the sucrose sirups.

In the total contents based on the soluble solids content only, the replacement of a 30° Brix sucrose sirup as a packing medium for canned fruit with a Sucaryl or saccharin sirup of equivalent sweetness resulted in a reduction in calories of 50 per cent or greater.

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Malnutrition in Africa

Speaking at the dinner of the spring meeting of the Food and Nutrition Board in Washington, Dr. John F. Brock, Professor of the Practice of Medicine, University of Capetown, South Africa, reported on a nutrition survey in Africa. He said:

"Among the peoples of Africa, particularly the Negroes and Bantus, there is a high incidence of 'kwashiorkor.' This disease appears among children, producing a feverish, miserable condition accompanied by universal edema, fatty liver, and loss of the enzymes from the pancreas and intestinal secretions. The hair of the victim loses its black, oily, tight curl and assumes a red color which has a pigment quite different biochemically from the red hair of the Europeans. The immediate cause of this condition is that the child has been displaced from its mother's breast by the next succeeding child and has been put on a diet consisting almost exclusively of starch. The name 'kwashiorkor' may be translated to mean 'red boy.' While this could refer to the color of the hair, its real significance, according to etymologists, is that the child is possessed by the red devil of jealousy.

"It is not yet known whether the condition results from a quantitative protein deficiency, from poor quality protein, or from a deficiency of accessory food factors normally associated with good protein intake. Until a few years ago the disease was regarded as incurable, but in recent years it has been clearly demonstrated that it is easily curable with reconstituted dry skim milk. In four to six weeks, the fat disappears from the liver, the enzymatic secretions return to the pancreas and intestines, the color of the hair begins to return to normal, and the child is capable of developing into a healthy, normal child. However, protein malnutrition undoubtedly persists throughout the life of most of the 120 million people of Negro and Bantu origin.

"While engaged in this study, the nutrition research unit investigated the small group of original Bushmen who still follow their old, primitive cultural practices that go back to the late Stone Age. These people have never domesticated an animal, never cultivated any food crop whatever, and never stored food from one day to the next. Their traditional pattern of life is the small family clan, following the herds of wild game. Only in the last ten years have they used any metals, and they still use a bone-headed arrow, poisoned with a curare-like poison, for pursuing their game. They shoot a small arrow into the animal, then follow it till it dies. They they sit around and eat until they can eat no more. They sleep, wake up, and eat again, until the animal is finished. When the hunting is poor, the women dig roots and gather nuts and berries, but only enough for today.

"These primitive people are wiser than the more advanced Bantus in the feeding of their babies after weaning. The Bushmen feed a mush made of nuts and beans, which is rich in protein, and they do not have kwashiorkor. The Bantus and Negroes use corn and cassava and other things which are easily grown and this leads to kwashiorkor."

Teaching Food Preparation

Individual-Laboratory vs. Modified-Demonstration Method[1]

MAY S. BAY[2]

Graduate Student, School of Home Economics, Michigan State College, East Lansing

DO you recall how much easier it was to learn to mix and roll a pie crust, or to make a buttonhole, or to iron a shirt after you had been shown how to do it? Think how many times you yourself have said to a student, or employee, or member of your own family, "I'll show you how to do it." To *show* how, so that someone else will *know* how, is as old as teaching itself.

Those of us actively engaged in teaching know that demonstration is only one of many methods and techniques used in teaching, and we see that methods of instruction vary considerably with both teachers and subjects taught. The preferences and personality of teachers, as well as their experience and capabilities, play an influential part in determining how they teach and the effectiveness of their instruction. Equipment and laboratory facilities, as well as financial limitations, may also influence their choice. What method—or methods—is best suited to produce maximum development of all students remains an open question. However, most educators will agree that there is no one perfect method; no one method fits every situation equally well.

In laboratory courses in home economics and other sciences, the demonstration method has been used successfully to teach particular units of work as well as the entire content of some courses. Such advantages as financial savings and saving in teacher-time and pupil-time have been noted by many (1–8). Courses in chemistry and the biologic sciences taught entirely through demonstration require less equipment and laboratory space as well as fewer supplies and materials. Some teachers have reported that their students learned more or retained information longer when this method of instruction was used (4, 6, 9–14). On the other hand, one of the most common objections to demonstration teaching is that students do not receive adequate experience in laboratory skills (15, 16). We would all agree that in laboratory science courses, learning the proper technique is important and not to be left to chance. Also, there are some workers who have stated that students did not learn as well, or retain as much information under this method of teaching (15, 17). Others have found no decisive differences between the two methods and have concluded that students did equally well by using either technique (18, 19).

In determining whether to use the demonstration technique we must satisfy ourselves that our instruction will be as good, as effective, as thorough, and as easily understood as if we employed other methods.

While there have been many studies in using the demonstration method for teaching chemistry and the biologic sciences, especially on the high school level, little work has been reported on the use of this method for teaching food preparation. Comley and Brown (1, 2) used the technique successfully to teach meal planning and service to eighth grade girls and concluded that "after girls have developed a fair amount of skill in food preparation, the demonstration method may be used with as great or greater success than the laboratory method." Bloye and Long (20) used the method for teaching a second course in food preparation and reported no measurable differences in the average test scores of groups taught by either method.

In the fall of 1950, due to delay in completing the remodeling of two foods laboratories at Michigan State College, the demonstration method was used for instructing classes in "Principles of Food Preparation I," or beginning food preparation. The units of study were not changed from those usually included in the beginning classes; only the method of presentation was altered to fit the existing situation. At the end of the quarter, the four teachers involved suggested that the demonstration method had shown advantages which had not been evident in teaching previous classes. However, since the program had

[1] Presented in partial fulfillment of the requirements for the degree of Master of Science. Presented at the 35th Annual Meeting of The American Dietetic Association in Minneapolis, on October 23, 1952.

[2] Present address: Mrs. May S. Johnson, Muskegon, Michigan.

not been carried out under controlled conditions, the findings were purely subjective. It, therefore, seemed desirable to obtain more concrete information concerning this problem and to apply experimental methods for comparing the effectiveness of the demonstration method with the method ordinarily used.

EXPERIMENTAL PROCEDURE

Because it was felt that to understand fully and to be able to make application of factual knowledge, a student must also acquire at least the basic manipulative skills and techniques in this particular field of study, it was decided to modify the demonstration method to include individual laboratory experience in at least half of the scheduled periods. The individual-laboratory method, or control method, consisted of preparation of food by the students after preliminary written and verbal instruction had been given. The modified-demonstration method utilized, in addition, demonstration by the teacher for presenting the material, supplementing this with supervised practice for individual experience in half of the scheduled periods. The terms "Method C" and "Method D" have been given to mean the individual-laboratory and modified-demonstration methods respectively.

Table 1 shows the distribution of students participating in this study.

Eight sections of approximately twenty students each were taught—two each for two terms by the author and by a second instructor. Each term, each teacher employed the individual-laboratory method in one class and the modified-demonstration method in the other. Two morning and two afternoon sections, taken from the regular enrollment of classes, were used each term. In all, 150 students were enrolled in these groups. Additional instruction was given to both groups by a third staff member through lecture classes and review sections.

TABLE 1

Distribution of students participating in the study

MAJOR FIELD OF STUDY OF STUDENTS	NUMBER OF STUDENTS			
	Teacher A		Teacher B	
	Method C	Method D	Method C	Method D
Term I				
Home economics	10	12	9	11
Hotel administration	10	7	9	4
Other	0	0	2	0
Total	20	19	20	15
Term II				
Home economics	15	8	14	13
Hotel administration	4	9	4	6
Other	1	1	1	0
Total	20	18	19	19

The conditions for instruction were controlled insofar as possible. That is to say, the same material and sequence of presentation were used for both groups, the same food products were prepared in the laboratory, the equipment and laboratory facilities were similar for all groups, the laboratory periods were all 1 hr. 50 min. long, all students used the same textbook and laboratory manual, and the same testing procedures were used for all students.

The final test was an objective-type, machine-scored test. Two 1-hr. written tests and a written laboratory test requiring short answers were graded by the two laboratory instructors using as objective a key as possible, with values for each question determined before the test was administered. The same teacher graded the same question on all papers and completed grading that test item before another question was graded. It has been stated that this technique materially increases the accuracy of scoring this type of test (21). Five short, unannounced tests were graded with a predetermined key, and the total scores were given a percentage value at the end of the term.

The laboratory practical test involved the preparation of two products, the recipes for which listed the proportions of ingredients, but no directions for procedures. The assignment was drawn by chance from the list of products studied in class. The products were judged by a skilled member of the foods staff and by the laboratory instructor using objective score cards based on the "Minnesota Food Score Cards" (22). In addition to preparing the products, the students wrote out full directions for the recipes, giving reasons for each important step. They also graded their products in terms of a standard product. Therefore, the final grade on the laboratory practical test was composed not only of the product scores, but also on the directions and reasons given for the procedure used and the ability to judge a standard product. No talking was allowed throughout the examination period.

In addition to the scores on these tests, the students earned "product grades" on laboratory performance throughout the course. While these were considered to be somewhat subjective judgments of the instructor, the grades were assigned, using objective score cards based on the "Minnesota Food Score Cards" (22).

RESULTS

Academic Grades

The data were analyzed statistically by use of the Fisher "t" test technique and by analysis of variance to learn whether any differences resulted from the two methods in instruction. Under the conditions of

this experiment, there was no statistically significant difference between the groups on the basis of either the final grades, the scores made on the final written test, or the average scores on the two 1-hr. tests. Analysis of variance also indicated that there was no significant difference between the results obtained through use of the two methods of teaching, and also that there were no significant differences between the results achieved by each teacher, or between terms.

In Table 2 are shown the results of the analysis of the scores on the laboratory practical tests, as determined by use of the Fisher "t" test. The use of this test indicated no statistically significant difference between the groups. It will be noted, however, that the mean scores of the demonstration groups were, in all cases, slightly lower than those of the control groups. It would appear from these data that any advantages in demonstrating laboratory procedures did not result in higher scores by the demonstration group on the laboratory practical test. On the other hand, the additional experience obtained by students in the control groups did not appear to result in significantly greater achievement on the same test.

For a further comparison of the students participating in this study, the final letter grades earned in "Principles of Food Preparation II" were obtained for as many students as possible. The method of instruction in the second course is similar to the control method in this study. Table 3 shows the comparison of the final letter grades earned in the two courses.

It will be noted that the majority of students received the same letter grade in both courses, and a small number of students earned a higher grade in the second course. But 44 per cent from the control groups as compared to 27 per cent from the demonstration groups earned lower grades in the second course. Could it be that the demonstration students, having been shown the correct methods and proper procedures, made better application of their knowledge during the succeeding course? Was it a situation where first seeing the correct methods and proper procedures helped these students to remember the subject matter for a longer time than did students taught by the conventional method?

While these data might suggest a difference in the retention of knowledge by the two groups, further measurements would need to be made to determine any real difference resulting from the use of the two methods of instruction. It is planned that further evaluation of these students and of their achievements in terms of grades will be made as they are enrolled in succeeding courses.

Cost of Food Supplies

In addition to evaluating the achievement of the students taught by the two methods, a record was kept of the cost of the food supplies used in one laboratory section of each type for one term. The supply orders were the same for all the demonstration groups and for all the control sections, and were identical for both terms. Table 4 gives this comparison.

It will be noted that the difference in cost of the food supplies for the two groups was $16.86, which constitutes a 22 per cent saving in the demonstration group. Since four groups were taught by the modified-demonstration method, the saving for this study was approximately $70. When one considers that three to six sections of this course are taught every term, the difference in the cost of the two methods assumes considerable importance. To be sure, other factors will influence costs, such as fluctuating prices, size of classes, and the ability of the teacher to plan and order supplies. However, the saving effected by the use of the modified-demonstration method merits attention and consideration by curriculum planners and administrators.

TABLE 2

Mean scores and ranges on the laboratory practical test

TEACHER	METHOD C			METHOD D		
	Number of students	Mean score	Range	Number of students	Mean score	Range
Term I						
Teacher A	18	87.1±2.28†	69–100	18	85.1±2.26	67– 97
Teacher B	18	82.3±1.75	73– 95	14	79.6±2.38	61– 92
Term II						
Teacher A	15	86.4±2.38	72– 97	15	84.0±2.00	71–100
Teacher B	19	83.8±1.92	69–100	19	81.2±2.48	61–100

† Standard error of the mean.

TABLE 3

*Comparison of final letter grades earned in two food preparation courses**

COMPARISON OF GRADES	STUDENTS			
	Method C		Method D	
	Number	Percentage	Number	Percentage
Higher grades in Course II than in Course I	2	3	6	11
Same grade in both courses	33	53	34	62
Lower grades in Course II than in Course I	28	44	15	27

* The grades of Term I and Term II students of both teachers have been considered. Grades of twenty-two students were not available.

DISCUSSION

There were other observations by the teachers which influenced the acceptability of the demonstration method. Although neither teacher experienced any lasting difficulty with any of the groups, and all students appeared to be interested in the laboratory work, both teachers expressed the problem of having to "work hard" to keep the students in the demonstration group interested and alert. This offers a real challenge to any teacher.

Clarity of directions is another factor difficult to evaluate. Both teachers observed that, in many instances, the use of verbal and written directions preceding individual laboratory work was less effective than when demonstration preceded practice experience. This was especially true when different types of equipment were used, as in the preparation of beverages, or when alternative methods of procedure were involved, as in the preparation of white sauce. Demonstration rather than lecture may be more meaningful to the student when more than one method of procedure may be used. The demonstration technique has the advantage of helping pupils "see" how things are done and of helping them understand the reasons for following certain methods. A single teaching demonstration may serve many pupils, whereas individual laboratory assistance is more time-consuming and meets the needs of fewer students.

TABLE 4

Comparison of costs of food supplies used for one term

LESSON	COST		
	Control group	Modified-demonstration group	Saving
Salads	$ 3.87	$ 3.30	$ 0.57
Gelatin products	2.02	.82	1.20
Flour and gluten	.19	.19	—
Muffins—variations in mixing	2.26	.47	1.79
White sauce, cheese	1.83	1.76	.07
Cereal dishes	4.35	1.60	2.75
Beverages	1.67	1.16	.51
Breakfast eggs	4.26	1.15	3.11
Custards	2.33	.74	1.59
Omelets	1.64	.27	1.37
Soufflés	3.51	3.51	—
Puddings	2.37	2.37	—
Leavenings—baking powder	2.43	.56	1.87
Leavenings—soda	1.67	.30	1.37
Muffins—standard products	3.80	3.80	—
Fruits	1.78	1.12	.66
Candies	2.43	2.43	—
Practical examination	3.62	3.62	—
Total	$46.03	$29.17	$16.86

Both teachers stated that the practice time for students in the modified-demonstration group should not be reduced. Experience in "doing" is important. While the results of this study do not indicate significant differences between the levels of achievement by either group, it is possible that any less time in laboratory experience might have resulted in greater differences, especially on the scores of the practical test. It is believed that time and work efficiency will, in some respects, be related to experience, and reduction of laboratory time for the modified-demonstration group might result in less proficient work being done in succeeding courses.

SUMMARY

It is questionable whether the students learned more through the use of one teaching method than the other. However, the modified-demonstration method, as it was carried out in this study, was no less effective as a teaching technique for instructing students in beginning food preparation. In addition, it resulted in a considerable saving of money. The extent to which teacher-demonstrations can substitute for practical experience in a beginning food preparation course, and at the same time allow the student to gain necessary experience in manipulative skills and techniques, is debatable. It is necessary to decide the circumstances under which, and the units of study for which this technique will be most successful. However, making greater use of teacher-demonstration and supplementing it with individual laboratory experience would seem to be a way to combine many of the advantages of both methods of teaching.

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BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

Christian Eijkman—August 11, 1858–November 5, 1930

The latter half of the nineteenth century saw the development of bacteriology under the leadership of Pasteur and Koch and the introduction of asepsis in surgery through the work of Lister. The germ theory of disease was firmly established by the beginning of the twentieth century. For this reason, the work of investigators who were showing that purified mixtures of food constituents failed to produce growth, or even survival of the experimental animals, did not receive the attention it deserved. It was difficult for a germ-conscious scientist to realize that disease could be caused by something lacking in food. It was not until 1912 that the vitamin theory began to receive recognition, although Eijkman's experimental studies on production of beriberi were reported in 1890 and 1897.

The first clinical descriptions of beriberi were made in the seventeenth century by two Dutch physicians from cases observed in the Dutch East Indies, but it was Christian Eijkman who presented the first evidence regarding the cause of the disease.

Christian Eijkman was born August 11, 1858, in Nijerk, a small town on the Zuider Zee where his father was a schoolmaster. At the University of Amsterdam, Eijkman studied medicine and became assistant to the professor of physiology. He obtained his medical degree, was appointed army surgeon, and went to the Dutch East Indies in 1883. Two years later he was sent home to recover from malaria. Back in Holland, he became interested in the new science of bacteriology and studied under Forster in Amsterdam and Robert Koch in Berlin.

In 1886, Eijkman was appointed by the Dutch government to a commission to study beriberi in the East Indies where it was causing so many deaths. The commission believed that beriberi was a problem of infection, but in order to study it further, Eijkman remained in Batavia as director of the new research laboratory of bacteriology and pathology. Fortunately, he studied fowls fed table scraps of polished rice from the military hospital. The fowls developed symptoms similar to those in beriberi patients. By lucky chance, the supply of scraps was stopped and raw brown rice had to be used, with consequent recovery of the birds. Then, in collaboration with the health inspector, Eijkman studied 101 prison diets in Java and showed that there was a relation between the incidence of beriberi in human beings and the kind of rice eaten.

In 1896, he was again invalided home and was appointed Professor of Hygiene at the University of Utrecht. When he published his paper on causes of beriberi in 1897, his theory was not accepted. Later work by his countryman, Grijns, helped to establish beriberi as a deficiency disease, and in 1929 Eijkman shared with F. G. Hopkins the Nobel Prize.

Eijkman made other contributions to knowledge of nutrition through studies of food consumption and metabolism of natives and Europeans in the tropics. At Utrecht, he developed tests for detection of bacterial contamination of food and water. He died November 5, 1930 in Utrecht.

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Problems of Fiscal Control in Hospital Food Service[1]

ROBERT SIGMOND

Director of Fiscal Studies, Commission on Financing of Hospital Care, Chicago; Assistant Administrator, Albert Einstein Medical Center, Philadelphia, on leave of absence

WHEN we speak of fiscal control of hospital food service, let us first be certain that we have no illusions of magical power. Last year, our seven thousand hospitals spent over $4 billion. Hospital costs, of which dietary costs are such an important component, have been rising for decades and have increased at the rate of $30 million a month for the past five years. It is reasonable to assume that they will continue to rise in the future.

We are no King Canutes to turn back this rising tide—nor do we wish to be. The prime reason for the increase in hospital expenditures has been the great increase in medical knowledge. To put this knowledge to use, hospitals have had to expand their facilities with new equipment, new drugs and other supplies, and new and more skilled personnel. For example, less than two decades ago the use of blood transfusions was unusual. Last year hospitals gave more transfusions than the total number of patients admitted to general hospitals twenty years ago, and there are now over twenty-five hundred hospital blood banks staffed by highly trained technicians and supervised by expert hematologists.

Today a hospital that provides a full range of services spends twice as much per patient-day as the hospital with only hotel services, an operating room, delivery room, and minimal x-ray and laboratory facilities. So far as we are committed to improve our standards of hospital care, we are committed to increased expenditures.

Viewed in this light, fiscal control is more important than ever before. Although in most hospitals it is impossible to cut costs, it *is* possible to control the rise in costs. Every penny wasted serves only to delay the expansion of services and improvement in the quality of care. Any method for controlling costs which will not impinge on quality and will save more than it costs must be tried.

[1] Presented before the Illinois Dietetic Association on March 13, 1953. The views expressed in this paper are those of the author and do not in any way necessarily represent those of the organizations with which he is connected.

The importance of food service control in relation to hospital costs is readily apparent when it is realized that in general hospitals, the direct expenses of the dietary department—food, salaries, and supplies—account for one dollar of every five or six spent. Among voluntary general hospitals in Illinois during the past five years, direct dietary expenses made up 17 per cent of total expenses. In terms of money spent, the dietary department is the second largest in the hospital.

Dietary costs have not been rising as rapidly as other hospital costs. Since 1947 dietary expenses in Illinois hospitals increased 32 per cent compared with a 56 per cent increase in all other hospital expenses. This is primarily because new services and facilities are being rapidly superimposed on the basic hospital operation. The dietary department, on the other hand, is providing the same three meals and one or two "nourishments" to each patient per day. Actually, because of the trend to cash salaries for hospital employees, dietary departments are serving fewer meals per patient-day each year. My guess is that the number of meals served per patient-day has decreased approximately 15 per cent during the past ten years. Nevertheless, it is probably still true in most hospitals that at least as many meals are served to employees, students, medical staff, and so on, as to patients. Most hospitals that I have studied serve six to seven meals per patient-day.

As ancillary hospital services, especially services to out-patients, increase and as meals served to employees decline, it appears that the proportion of the hospital dollar spent by the dietary department is bound to decrease.

Direct dietary expense now averages about $3 per patient-day in Illinois hospitals. If it is assumed that six meals are served per patient-day, this means that direct expense per meal is 50 cents, which does not appear to be an excessive amount in comparison with meal costs outside of hospitals.

Dietary department expense consists of three parts: food, salaries, and supplies. Food now accounts for about 50 per cent of expenditures; payroll, about 45 per cent; and supplies, about 5 per cent. In recent years the proportion of dietary expense for food has decreased markedly. Ten years ago, two-thirds of dietary expense went for food, but increased salaries to dietary help have raised the payroll component. In all likelihood, in a few years food will account for even less than half of the total dietary costs.

It is interesting to note that in Illinois, direct dietary expense per patient-day increases with hospital size. Illinois hospitals with 250 beds or more spend half again as much per patient-day for dietary as those with less than 50 beds. This relationship appears to exist throughout the country and casts doubt on certain generally accepted principles of the economy of large-scale operation in the hospital dietary field.

The rise in per-patient-day dietary costs as hospital size increases is due almost entirely to a rise in per diem payroll. Large hospitals spend about the same per patient-day for food as do the small ones. The rise in per diem payroll in larger hospitals results primarily from the necessity of employing additional personnel to man the patient units, although salary rates are also higher. Ninety per cent of hospitals with less than 100 beds have centralized food service but only half of the hospitals with 250 beds or more are centralized.

This review of certain basic facts concerning hospital finance and hospital dietary expenditures provides perspective for a more specific discussion of the problems of fiscal control of hospital food service.

I shall outline an eight-point program for controlling hospital food costs. None of these points can be carried out by the dietitian alone, and the first three lie completely outside her scope. Most of them, however, require her leadership.

REDUCE NUMBER OF PATIENTS

The greatest potential for lowering hospital dietary costs is the admission of fewer patients to the hospital to be fed. Many authorities now agree that many patients admitted to our hospitals could be treated effectively on an out-patient basis. Studies by Barnett (1) in Detroit, Bennett *et al.* (2) in California, and others suggest that at least 10 to 15 per cent of patients admitted fall into this class. If we served 10 to 15 per cent fewer meals, we should be able to cut dietary costs by at least half as much. Increased emphasis on preventive medicine and day-to-day improvement in health practices should further reduce the number of persons sufficiently ill to require hospitalization, further reducing dietary costs. This would not cut unit costs, but it is the over-all costs that the community must meet.

SHORTEN HOSPITAL STAY

The second greatest potential for lowering dietary costs is a continued shortening of the number of days each patient stays in the hospital. During 1946 and 1947, we chopped a whole day off the average length of stay. There has been very little further decline since then. If the average stay were reduced another day, the number of meals to be served to patients would decline 12 per cent. Further medical advances in the future, as in the past, should develop new methods for treating patients in shorter periods of time. Even today, a medical review of the census in most hospitals would reveal some patients whose condition had already improved beyond the point of needing further institutionalization. Any patient who stays in the hospital a day longer than is needed requires expenditure of money for the preparation of three meals. From the public's viewpoint, this is wasted money.

STABILIZE DAILY CENSUS

A third potential for controlling the rise in dietary costs is development, by the administrative and medical staffs, of a program to stabilize the daily census. At present, the average census in voluntary general hospitals is three-quarters of bed capacity. But hidden behind this average is great variation within each hospital. A hospital with an average occupancy of 75 per cent may be completely filled or filled to overflowing part of the time and half empty or less at other times. A hospital dietary department must be prepared to feed all of the patients at each meal, no matter how many there are. It cannot lay off and hire personnel to adjust to rapidly changing demand for meals. A department staffed to feed a full house will have high costs when the house is half empty.

Relatively few hospital admissions are emergencies today. Most can come in at the convenience of their physician and the hospital. Careful scheduling of admissions will stabilize the dietary department's work load and cut costs.

COMPETENT DIETARY ADMINISTRATOR

A fourth potential for controlling dietary costs is the employment by each hospital of a person responsible for the operation of the dietary department, who is qualified and trained in the science of nutrition and the principles of food service management. Without such a person, it is impossible to think of controlling the costs of effective food service. Our object cannot be reduction of costs at the expense of the patient's recovery or comfort.

Relatively few hospitals comply with the minimum standard of the American College of Surgeons for hospital dietary departments (3) which provides that: the department shall be "under the direction of a competent graduate dietitian whose training

conforms to standards approved by The American Dietetic Association." Recognized authorities have stated that this situation exists because the small institution cannot afford a dietitian. But most general short-term hospitals are small; over half of them have less than 100 beds. The addition of a dietitian in even a 40-bed hospital would increase costs only 50 cents per patient-day, less any savings the dietitian might effectuate.

Actually, lack of a dietitian is not a characteristic peculiar to small hospitals. Only one-third of the institutions for the mental, tuberculosis, and chronically ill, which average 600 beds per hospital, employ a dietitian. Similarly, only about 30 per cent of the short-term voluntary general hospitals with less than 100 beds employ a dietitian.

It has also been suggested that not all hospitals can have dietitians because not enough are available. This is a more serious problem which hospital organizations and the dietetic profession must go to work to solve.

Let us look at some facts. Recently The American Dietetic Association announced that its ten thousandth member had been accepted, double the number of ten years ago. However, of the 10,000 members, only 8,000 are actually working, and probably no more than 6,000 work in hospitals. It is interesting to note that over a third of the dietitians working in hospitals are employed by less than two hundred different institutions, mostly large general hospitals.

Hospital organizations and the dietetic profession have a responsibility to explore every means of insuring qualified supervision of food service in every hospital. The following program is suggested:

(a) Improvement in salaries and working conditions to attract more persons into the profession and to attract more dietitians to enter the hospital field from their present positions or from retirement.

(b) Estimation of a head dietitian's prestige on the basis of how few, rather than how many, dietitians are working for her. In 1950, if every hospital had reduced its professional dietary staff to not more than two, over 2000 dietitians would have been available to hospitals lacking this essential skill. To bring about a more equitable distribution of dietitians among our hospitals, heads of large dietary departments must stimulate professional members of their staffs to seek places for themselves as dietary directors. This requires more than just a change in attitude. First, the functions of the professional dietitian must be studied to determine the maximum number which may be delegated to less highly trained workers. Second, there must be a training program to develop nonprofessional dietary personnel. Third, there must be a program to develop personnel capable of supervisory duties, and with professional status, but at a level below that of the professional dietitian.

(c) Further development of techniques whereby one dietitian serves two or more neighboring hospitals in a supervisory rather than a consulting capacity.

This program would improve food service in our hospitals and maintain the professional standards which dietitians have struggled for so valiantly over the past forty years.

CHECK PERFORMANCE WITH COST RECORDS

A fifth potential for controlling food service costs is the maintenance and use of records designed to furnish the facts necessary to evaluate the dietitian's administrative decisions. Most of these records should be accumulated and summarized in the hospital business office, and the dietitian must work closely with the chief accountant to assure that he recognizes her needs and provides her with required data promptly.

Many hospital accounting offices are overwhelmed by their fundamental job of receiving and paying out money, but the administrator who is interested in controlling costs will see that the necessary data are supplied if he is sure that the dietitian will use them.

This calls for a word of caution. It does no good to accumulate perfect records if they are not going to be used by the dietitian as a practical, everyday tool to check her own decisions and techniques. If you can learn to transfer your thinking about your department from a living, functioning operation to a tabulation of cold numbers and back to the living operation again, you will have no trouble developing a record system that gives you the facts you need to make the correct decisions and to justify them. All of us, no matter how familiar we are with our specialty or our own operations, can learn much—even to the point of being taken by surprise—from the records which show the results of our own action.

A record system should be as simple as possible and should be adapted to meet the particular situation. The dietitian will need one basic figure, the monthly per meal cost, obtained from the business office as soon after the end of the month as possible. It would be useful to have this classified into food, salaries, and supplies. It would even be better to have the food subclassified into storeroom items and perishables, and further subdivided into classes of food, but these latter refinements are not absolutely essential.

I believe that the dietitian will go a step further in order to administer her department most effectively. She will want to determine the daily raw food cost per meal, preferably the day before rather than the day after. The dietitian has a great deal of leeway in translating calories, protein, carbohydrate, roughage, and vitamins into dollars spent. If she has a given sum of money to work with over a period

of time, she must predetermine her costs if she is not to be caught "short" or "long."

The technical problems involved in daily costing cannot be reviewed in detail here. Such costing, while not difficult, can't be done by the business office; it must be done in the dietary department. This means that the department must have a clerk, whom it should have anyway. By assisting the dietitian in various routines, such as checking quantities of goods received, verifying prices, checking inventories, establishing meal counts, handling personnel records, and answering the phone, a properly supervised clerk will more than pay for herself.

For further details on cost control records, every dietitian should be familiar with the handbook on *Food Cost Accounting* prepared by the American Hospital Association (4).

PERSONNEL MANAGEMENT

A sixth potential for controlling dietary costs is found in the area of personnel management. Payroll now accounts for almost half of dietary expense, and this proportion is rapidly increasing. The problem is not one of holding down pay scales. Rather we must concentrate on getting at least a dollar's worth of work for each dollar in the pay envelope.

The general approach to personnel management is much more important than the techniques involved. The simpler the system of personnel management, the better. In my opinion, it should be based on recognition that the work output of an individual may vary from 200 to 300 per cent, depending largely on the degree of motivation. A good personnel management program may have many ramifications, but will have two essentials: first, sufficient pay to attract persons who offer something to work with; and second, proper motivation for these persons.

Proper motivation depends on only a few basic attitudes which should be present in dietitians, dietary help, hospital administrators, and almost everyone else:

(a) A feeling that the specific job is essential and is identified with something larger and more important. Certainly it should not be hard to instill this attitude in hospital employees, but how many of us have succeeded?

(b) A feeling that good work is noticed and appreciated, and that an employee's idea of how to do the job better is solicited and considered.

(c) A feeling that there is room for advancement, that a good dishwasher will be considered for an opening as salad girl, that a good salad girl will be considered as a potential assistant cook. This requires a continuous program of day-to-day in-service training, not necessarily as a formal organized program, but as part of the ordinary routine.

(d) A feeling that pay, promotions, working conditions, and discipline as practiced are equitable in comparison with others. Equity within the department is more important than equity within the hospital, which, in turn, is more important than equity within the community.

Basically, achieving motivation adds up to application of the Golden Rule; treat people as you would be treated—as dignified human beings.

It is much easier to carry out this type of program in a small organization than in a large one. When we are in close contact with people, we naturally tend to do the right thing, and formal techniques are not so important. In a large organization, where day-to-day contact is limited, it becomes necessary to develop procedures to apply the same principle.

The idea that dietary jobs require just so many "pairs of hands" is becoming outmoded and will grow more costly as salary levels are forced higher. Transition from the "pair-of-hands" concept may not be easy, but it can and must be accomplished.

MODERN EQUIPMENT AND LAYOUT

A seventh potential for controlling rising dietary costs involves improvement in facilities, such as greater use of labor-saving devices and more rational layout of kitchens. In this I defer to experts in this specialty field. Suffice it to say, as an example, that in three hospitals out of ten, dishes are still washed by hand.

DIETITIAN-ADMINISTRATOR UNDERSTANDING

The eighth and final important potential for controlling dietary costs involves improved understanding and better working relations between the dietitian and the administrator. This subject requires a full paper in itself. Essentially, the dietitian must recognize that she is an administrator herself—administrator of the second largest department of the hospital. As such, she has a responsibility to bring situations that require the action of the administrator forcefully to his attention. Within the framework of the over-all policies and financing of the institution, she must campaign energetically for her needs, whether they relate to personnel, salaries, equipment, procedures, or relations with the purchasing agent, the storeroom, the business office, the nursing department, the maintenance crew, or the medical staff. Dietitians should not become "itches," but if they don't present their needs to the administrators, no one else is going to do so. Each administrator is different, and each dietitian must figure out the most practical way to cope with hers.

The methods of minimizing costs which have been discussed, of course, do not comprise a complete listing. We have not even mentioned such procedures as dining-room service for patients not confined to bed, standardization of special diets, and improvement of purchasing techniques. But this

eight-point program, I believe, offers the greatest possibilities for holding the cost of quality food to a minimum.

Some of the points could not be achieved in most hospitals at this time, but all of them are, I submit, worth considering.

In summary, hospital costs have been rising. To the extent that it reflects expanded and more effective service, this increase is desirable; it should, and will, continue. Since dietary service accounts for from one-sixth to one-fifth of hospital costs, savings derived from proper control of dietary expenditures can represent a significant contribution to improvement in other services. Costs may be minimized through increased use of out-patient facilities; shortened length of stay; stabilization of occupancy; employment of professional dietitians; utilization of cost records; improved personnel methods; improved facilities; and better dietitian-administrator relationships.

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Papaya—A New Fruit in the U. S.

Are you acquainted with Hawaiian papayas, now becoming available on the Mainland? They are interesting, delectable, and nutritious. A native of the Marquesas Islands, early in the 1800's papaya was brought to Oahu with its ideal growing conditions. Greatest commercial development of papaya, however, has taken place since World War II, and today more than 600 acres in the Islands are planted with papaya trees. Much of the success of the crop is due to research work at the Hawaii Agricultural Experiment Station which has resulted in larger yields; uniform, high-quality fruit; and the development of the Solo variety of papaya.

Papaya is a melon-like fruit, pear-shaped, with a smooth skin and convolutions somewhat like an acorn squash. It grows on trees, close to the trunk rather than on branches. A tree bears continually after about twelve months, having the best harvest the first year. Growers plan on a twenty- to twenty-four-month harvest. The average yield is from 5 to 30 tons per acre.

Harvesting papayas requires skill and care to avoid bruising. Gloves are worn to prevent injury in cutting. Single layers of the fruit are placed in padded, paper-lined boxes and carried to a treating plant, where it is carefully treated to kill all stages of Mediterranean fruit fly. The fruit is then packed, five to eleven pieces to a cardboard carton, net weight 10 lb. Depending on the individual packer, sometimes the fruit is paper-wrapped like grapefruit, sometimes it is placed on a bed of excelsior or shredded paper. The fruit is then loaded into a refrigerated hold maintained at 50°F. and shipped to the Mainland.

The fruit is from 3 to 5 in. in diameter, about 5 or 7 in. long, and weighs from ¾ to 1½ lb. The flesh—from 1 to 2 in. thick—varies from light yellow to salmon pink. As papaya becomes eating ripe, the skin turns from emerald green to deep orange and the flesh becomes soft, tender, and easily crushed. To test for ripeness, hold the papaya between the palms of both hands; if the fruit yields to gentle pressure, it is ready to eat.

Preparation of papaya is simple. Just cut lengthwise, remove the black seeds and gelatinous membrane, as in preparing melon. The pulp is eaten as you would a melon, with salt or a sprinkling of lemon or lime juice. It can also be used as a delightful and refreshing ingredient in fruit cocktails, in salads, and as a topping for ice cream. Papaya is a premium fruit with an indescribably far-away flavor that bespeaks the tropics. If the taste must be indicated, it may be compared with honeydew melon, cantaloupe, peach, pear, or apricot—or a combination of all of them.

Nutrition-wise, papaya is also desirable, with the following composition per 100 gm.:

calories—39	thiamine—20 mcg.
pro vitamin A—4000 I.U.	ascorbic acid—84 mg.
riboflavin—46 mcg.	niacin—0.28 mg.

Thus, the Hawaiian Solo papaya is exceeded only by guava and the West Indian cherry (a Puerto Rican fruit) in its ascorbic acid content; it is higher than that of oranges and strawberries. It also ranks among the first seven fruits with the greatest vitamin A value: mangoes, cantaloupe, apricots, persimmons, watermelon, Poha (another Hawaiian fruit), and papaya. Also, as the fruit ripens, reducing sugars increase and sucrose decreases. No starch is present. To reducing-diet-conscious Americans, the fact that papaya is low-caloried—39 calories per 100 gm.—is almost the best news of all.

Papaya—exotic, delicious, and rich in food values—offers an opportunity to introduce glamor to restricted meals and bring a pleasing note of refreshment to general diets.—*Ilma Lucas Dolan, Dietitian, California Foods Research Institute, San Francisco.*

Editorial

MABLE MACLACHLAN RESIGNS

The resignation of Mable Munn MacLachlan as Educational Director of The American Dietetic Association has caused sadness and a feeling of deep loss and regret. All of the members of the Association, as well as associates in the many allied fields to which she has made contributions, have looked to this quiet, calm, thoughtful, and intelligent woman for leadership and stability—"though not dramatic but always there—like a Rock of Gibraltar."

A native of Sault Ste. Marie, Michigan, Miss MacLachlan attended Michigan State College where she earned her B.S. degree. After completion of her college work with honors in home economics she taught for a few months in South Haven, Michigan. Later she accepted a position as Assistant in the Home Economics Department at Sault Ste. Marie and shortly became head of the department, a position she held for five years. She then entered training in dietetics at the University of Michigan Hospital, Ann Arbor, after which she was appointed to a position on the dietary staff. There, for four years, she was in charge of ward food service; she instructed student nurses on dietary problems; and she managed the commercial cafeteria. Her next position was that of teaching foods and nutrition at the Michigan State Teachers College in Ypsilanti, Michigan.

Following this experience, Miss MacLachlan did graduate work at Columbia University, where she was granted her Master of Science degree. On completion of this academic work she returned to the University of Michigan Hospital, first to be administrative dietitian in charge of food production, and later, in 1934, to become Director of the Dietary Department and Housekeeping. In this capacity she was also director of the hospital's approved dietetic internship. More than 300 students have had the privilege of her personal guidance and leadership. Miss MacLachlan resigned her position at the University of Michigan Hospital on June 30, 1948; and, on September 1, 1948, she accepted the appointment as Educational Director of The American Dietetic Association.

Her experience as Treasurer, President-Elect, and President of The American Dietetic Association (three major positions on the Executive Board); as a Past-President of the Michigan Dietetic Association; and, in addition, her previous activities in hospital dietetics have constantly served her in good stead in fulfilling her varied duties as Educational Director. To this position she brought a sympathetic understanding of the very important job to be accomplished; and in her years of service her efforts were untiring in meeting the problems of improving and establishing educational goals.

As the director of her own department and internship, she had always required students and staff to base judgment on actual facts, demanding that their fundamental knowledge of nutrition and administration be adequate; and that they should have an open mind regarding the new—"not the first by whom the new was tried, nor yet the last to cast the old aside." She inspired students to continue learning; she, too, always respected knowledge and was always eager to learn. When a student was in error, her concepts were not torn down without patient efforts to help her in reconstructing something better, more sound and permanent. Her belief in the abilities of her students and staff engendered in them a feeling of security and well-founded self-confidence, with the result they developed maturity which served them well as a guide when they set sail alone on careers in hospital dietetics.

They were taught that the department operated to play an important role in the care of the sick.

They also learned that the details of administration would help the dietitian to serve more efficiently that "most important person," the patient. She also emphasized that the dietitian should not become so entangled in the web of routine that the patient would be neglected. As a result of these teachings, dietary service became "patient centered, research oriented." As a director, Mable Munn MacLachlan was always a capable teacher, ready with suggestions and helpful advice.

In her visits to various hospitals to review approved internships, Miss MacLachlan brought to the internship director a wealth of helpful advice and counsel, practical but filled with vision. Her capacity for work, her ability to organize, her honesty, sincerity, and straightforward, warm, friendly manner created excellent working conditions with each group, just as they had with her own students and staff.

There has always been an interchange of deepest respect among members of any professional team of which she has been a member. She has never sought personal glory; her unselfishness and loyalty to her profession are living examples of the ethics by which our profession operates. Her ideals have served as a goal for many with whom she has had contact. During her five years as Educational Director, the fruits of her efforts have been manifested in the fine advancement made in the quality of teaching standards in the internships.

Mable Munn MacLachlan will always be an inspiration to her many former students and staff, as well as to past and present Association members. She will always be vitally interested in their happiness, their progress, and their contributions to our profession, just as she will continue to be herself—the quintessence of personal and professional understanding and growth.

We feel sure that Miss MacLachlan will continue her contributions to the field of dietetics. Her untiring efforts in carrying out the objectives of The American Dietetic Association have resulted in strengthening the position of the dietitian and in promoting better understanding and recognition of the role of the dietitian in the improvement and maintenance of national health. Likewise, her constant efforts to establish and improve educational standards for dietetic interns have borne fruit in the increasing numbers of dietitians trained to serve efficiently.

Miss MacLachlan plans to spend the next year at her home in Sault Ste. Marie. After these vacation months, we sincerely hope we shall have many future contacts with her in our professional field. Her resignation as Educational Director of The American Dietetic Association has been accepted with regret and full realization that the Association staff is losing a valuable member. However, we are counting on her to continue through other channels her much needed contributions to the needs of our Association and of other groups allied to our profession. We all extend to her our heartfelt gratitude and sincere wishes for continued success, a great deal of happiness, and good health in the years to come.—*Mary E. McKelvey, Director of Dietetics, The Christ Hospital, Cincinnati.*

Cleaning and Decontaminating Radioactive Surfaces

In the Foster D. Snell industrial laboratories, New York, a two-year study has been conducted to learn the best way or ways of cleaning radioactive contamination of surfaces, such as walls and buildings. First report of this work was made in Paris at the 26th International Congress of Industrial Chemistry in June.

After one recent test at Yucca Flat, according to newspaper stories, 100 cars were contaminated. It follows that any structures at the same relative location would have been contaminated, and such surfaces must be decontaminated before they are safe for use.

The laboratory tests by the Snell organization indicate that the major part of the decontamination can be done by the housewife if necessary, using largely materials she has on her kitchen shelf. However, some surfaces, notably plaster, require special treatment.

For the tests, a group of fission products supplied by the Oak Ridge National Laboratory was incorporated into synthetic soil representative of the dirt in the air over industrial cities. This was applied to such diverse types of surfaces as tin, glass, cement, gypsum plaster, unpainted and painted wood, cotton cloth, and even the shaved skin of rabbits. After the deposit had been allowed to dry, it was "deterged" by standard techniques using commercial soaps, light-duty synthetic detergents (syndets), and heavy-duty syndets. The degree of contamination and removal was measured with the Geiger counter.

The heavy-duty syndets were generally more effective than either light-duty syndets or soap. Further tests were made with chemical compounds known as "sequestrants," which have the property of "locking up" in the compounds many elements, such as calcium and magnesium, and, fortunately, the rare-earth elements produced as fission products.

The most economical sequestrant to use was found to be a modified form of sodium hexametaphosphate (Calgon). When two parts of this harmless chemical are mixed with one part of either soap or syndet and applied in 1 per cent solution in water, removal of the radioactive contaminant from almost all surfaces was nearly complete. However, for gypsum plaster, removal by plain water was better than with any cleaning agent.

Current Comment

METHODS ANALYSIS[1]

J. RONALD FRAZER

Assistant Professor, Department of General Engineering, Iowa State College, Ames

Unless you are an exception, you are probably concerned about rising costs and methods of reducing costs. The terms "methods analysis" and "methods consciousness" mean different things to different people, but the most important thing to recognize is that being methods-conscious is being cost-conscious. The method by which a job is done determines how long it takes to do it, and the amount of time spent doing it directly affects the cost. On any of the serving lines or in other dietary department operations, if the time to do the job is increased, both the labor costs and the overhead will be increased, and there possibly may be some loss of customers who don't like to wait.

METHODS ANALYSIS

Methods analysis has many phases. The scope of methods analysis in your field must be determined by the costs involved and predicated on the possible savings that may result. On this basis, because of the cost of the food served, methods of reducing costs should be among the first things to be analyzed. Every effort should be bent toward standardization of food quantities. Such items as the analysis of methods by which ingredients are added, with an eye towards constant quantities, and analysis of meat cutting methods to insure constant size portions are typical of the areas where considerable savings could be realized.

Another phase of methods analysis that will be important to you is the design and selection of equipment. The relative economy of labor-saving devices is based on the length of time it takes to do the job, both with and without the particular device. In making a decision to purchase a piece of equipment, you must first satisfy yourself that the equipment can do the job. Then, it is necessary to determine how long it will take to do it with the piece of equipment and compare that with the time required to do the job without the equipment and also with the number of people required to work on the job for this period of time. Determination of the time required is basic to an analysis of whether the expense of a particular piece of equipment can be justified.

Another phase of methods analysis is the organizing, planning, and scheduling of the work. Most of you have peak loads at some times with slack periods at others. One thing that needs to be done is to schedule work for slack periods that can be done during those periods, thus keeping to a minimum the work that is done during the time of peak loads. To do this planning, one must know how long it takes to do the jobs that need to be done, and, therefore, how the jobs are going to be done. A similar problem occurs in the balancing of a serving line. If you have a bottleneck in one place in a cafeteria line, that bottleneck will determine how fast the people are going through the line. If these bottlenecks are to be eliminated, the time required for each job must be determined.

In addition, methods analysis includes the actual layout of the work area. The distance materials must be moved, especially during the time of peak loads, should be minimized, as should the distance people must walk back and forth in doing their work.

Lastly, methods analysis includes the analysis of the motion patterns that are used in doing each job. This phase of methods analysis has been placed last because it is basic to all other phases. Problems such as work organization, equipment selection, and so on all require determination of how long it takes to do a particular job, and the time required depends on the motion pattern used in performing that job. Thus, analysis of the basic motion pattern is considered fundamental to a program of methods analysis and cost reduction.

METHODS-TIME MEASUREMENT

One of the newer and better tools for methods analysis is *methods-time measurement*, commonly referred to as "M.T.M." M.T.M. is a procedure which analyzes any manual operation into the basic motions required to perform a job and assigns to each motion a predetermined time value. Thus in one operation, M.T.M. provides a method of analyzing basic motions, as well as time standards for the motion, allowing an analyst to determine readily which of two methods is the better and how much better it is. In addition, a time standard for doing the job is provided for use in planning and scheduling work.

The biggest problem encountered in developing

[1] Presented at the 35th Annual Meeting of The American Dietetic Association in Minneapolis, on October 23, 1952.

the data for M.T.M. was the classification of the basic elements. At first glance, it would appear that workers on different jobs would use virtually an infinite number of motions in performing their work. However, engineers took a great many motion pictures of different operations over a long period of time and analyzed them frame by frame, or picture by picture. This process is normally referred to as micromotion study. These engineers classified all of the hand and arm motions into eight basic elements. These basic elements were then subdivided according to the conditions under which they were made. Times were established for each subdivision of each basic element and put into tabular form, thus providing the basic data for methods-time measurement. In addition to the eight hand elements, several body elements were also identified.

I would like to present these basic elements of M.T.M. to you and give you some idea of how they are used and how M.T.M. works.

BASIC ELEMENTS

Reach is the motion used to get the hand or fingers to a location. M.T.M. analysis requires first the identification of the motion as a reach. Second, the reach must be analyzed in terms of the factors that cause the times for different reaches to vary. The first of these is the length of reach. Obviously, the farther away an object is, the longer it will take the hand to reach out to it. In addition, the time required is affected by the nature of the object toward which the reach is made. M.T.M. classifies reach into the following types:

(a) Reach for an object in a *fixed location*
(b) Reach for an object in a *general location*
(c) Reach for *objects in a group*
(d) Reach for *very small objects*
(e) Reach to an *indefinite location for body balance*

Identification of the motion as a reach, measurement of the length of reach, and determination of the type of reach will allow an analyst to go to a table of time values and find the time required to perform the reach.

Move is the motion used to transport an object to a location. As do the times for reach, move times vary with distance. However, the classifications of move are quite different from those of reach. The classifications of moves are:

(a) Move object to *other hand or against stop*
(b) Move object to *approximate or indefinite location*
(c) Move object to *exact location*

In addition to these classifications, allowances are made for weights of more than 5 lb. Allowances are also made for both reach and move times in cases where the hand is in motion either at the beginning or end of the reach or move.

Grasp is the motion used to gain control of one or more objects with the fingers or hand. One classification for grasp is the *contact grasp*, where control can be secured solely through contact, as compared with the *pick-up grasp*. Pick-up grasps are classified according to the size of the object picked up and the interference with the grasp. Two other classifications of grasp are: *regrasp*, which is an adjustment of the fingers to gain better control of an object; and *transfer grasp*, occurring when an object is shifted from one hand to another. *Regrasp* is one of the more difficult M.T.M. elements to identify. A good example of several regrasps occurs in adjusting a pencil to write with it after having picked it up off the table. Regrasp is present in almost every operation, and an analyst must be careful not to omit it.

Space does not permit detailed analysis of all elements, but, briefly, the other basic elements identified are:

(a) **Turn**—to turn the hand or an object by a twisting action of the wrist, measured in terms of degrees;

(b) **Position**—to align, orient, and engage one object with another, varying with three things: class of fit, symmetry of parts, and ease or difficulty of handling;

(c) **Release**—to relinquish control of an object by the fingers or hand;

(d) **Disengage**—to break contact between one object and another, varying with: class of fit, ease or difficulty of handling, and care of handling;

(e) **Apply pressure**—to execute additional force.

BODY MOTIONS

In addition to these eight basic hand and arm elements, a number of body motions have been identified. These body motions require considerably more time than the arm motions, in addition to being fatiguing. In general, the body motions do not do productive work, but merely get the body in a position to do productive work, and as such, should be eliminated wherever possible. They are: walk, leg motion, foot motion, side step, turn body, bend, stoop, kneel, arise, sit, and stand. Times have also been established for eye travel time and eye focus time.

SIMULTANEOUS AND COMBINED MOTIONS

There is one other concept that is basic to the M.T.M. procedure. That concept is a method of handling simultaneous and combined motions. *Combined* motions are those which occur when two or more motions are performed by the same body member at the same time. *Simultaneous* motions are those which are performed simultaneously by two or more body members. For both combined and simultaneous motions, only the time for the longest motion is allowed.

However, not all motions can be performed simultaneously. The M.T.M. data include a guide

TABLE 1

*Operation: ladling soup. Ladle is in soup container; bowls are stacked at left. Top bowl is to be filled and placed on counter**

LEFT HAND		TIME CONSUMED	RIGHT HAND	
Description of motion	M.T.M. definition of motion		Description of motion	M.T.M. definition of motion
First Method				
		T.M.U.†		
		11.5	reach to ladle	reach to object in general location
		1.7	grasp ladle	pick-up grasp, single object, easily grasped
		5.6	regrasp ladle	regrasp for better control
		5.6	regrasp ladle	regrasp for better control
		10.6	lift filled ladle to clear container	move object to approximate location
		18.7	move filled ladle to bowl	move object to exact location
		5.6	position ladle over bowl	position—loose, symmetrical, easy to handle
		9.4	turn ladle to pour liquid	turn 180°
		10.0	pour liquid	estimated—*not* an M.T.M. time
		18.2	move ladle back to container	move object to approximate location
		3.5	turn ladle into liquid	turn 45°
		1.7	release ladle	normal release
		10.5	return arm to side	reach to indefinite location for body balance
Reach for bowl	reach to object in approximate location	11.5		
Grasp bowl	grasp object lying close against flat surface	3.5		
Regrasp bowl	regrasp for better control	5.6		
Regrasp bowl	regrasp for better control	5.6		
Move bowl to counter	move object to exact location	16.9		
Place bowl on counter	position—close, symmetrical, easy to handle	16.2		
Release bowl	normal release	1.7		
Return arm to side	reach to indefinite location for body balance	14.2		
Total.....		187.8‡		
Second Method				
Reach for bowl	reach to object in general location	11.5	reach for ladle	reach to object in general location
Grasp bowl	grasp object lying close against flat surface	3.5	grasp ladle	pick-up grasp, single object, easily grasped
Regrasp bowl	regrasp for better control	5.6		
Move bowl over container	move object to approximate location	13.5	move filled ladle to bowl	move object to exact location
		5.6	position ladle over bowl	position—loose, symmetrical, easy to handle
		7.4	turn ladle to pour	turn 135°
		10.0	pour liquid	estimated—*not* an M.T.M. time
Move bowl to counter	move object to exact location	13.5	move ladle back to container	move object to approximate location
Place bowl on counter	position—close, symmetrical, easy to handle	16.2	return ladle into liquid	turn 45°
Release bowl	normal release	1.7	release ladle	normal release
Return arm to side	reach to indefinite location for body balance	14.2	return arm to side	reach to indefinite location for body balance
Total.....		102.7 ⁂		

* This should not be considered a time standard for all ladling operations and should not be used as such. Variations in type of bowl, ladle, work place, layout, distances involved, and so on, will cause the times for individual ladling operations to vary considerably. Separate analyses of each situation should be made.

† 1 T.M.U. = 0.036 seconds.

‡ 6.8 seconds.

⁂ 3.7 seconds.

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	*EGGNOG	MERITENE MILKSHAKE with whole milk
Protein	12.5 Gm.	15.8 Gm.
Fat	12.6 Gm.	8.0 Gm.
Carbohydrate	17.7 Gm.	25.5 Gm.
Calcium	0.24 Gm.	0.5 Gm.
Phosphorus	0.27 Gm.	0.4 Gm.
Iron	1.5 mg.	4.4 mg.
Vitamin A	843 I.U.	1745 I.U.
Thiamine	0.12 mg.	0.7 mg.
Riboflavin	0.45 mg.	1.6 mg.
Niacin	0.2 mg.	6.4 mg.
Ascorbic Acid	2.0 mg.	26.4 mg.
Vitamin D	30 I.U.	150 I.U.
Calories	233	237

*Eggnog nutritive values from Bowes, A. de P., and Church, C. F.: Food Values of Portions Commonly Used, Philadelphia, College Offset Press, 1951, Ed. 7.

†Based on 25 lb. institutional size can.

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chart showing which motions can be performed simultaneously, and which, in general, cannot. The reasoning used by most experienced analysts is that motions requiring neither conscious thought nor direction can be performed simultaneously, while those requiring both conscious thought and direction cannot.

CASE STUDY

Table 1 shows the M.T.M. analysis of two methods of performing a ladling operation such as you might find in a cafeteria line. The table shows a reduction time of nearly 50 per cent from the first method to the second. The important thing to notice, however, is the manner in which the M.T.M. analysis clearly shows what each method consists of, measures how much better the better method is, and provides a time standard for doing the job. It can also be valuable for training the worker.

SUMMARY

This brief explanation of methods-time measurement is intended to acquaint you with one of the newer tools of methods analysis. Careful analysis of the table will allow you to understand what M.T.M. is and what it can do for you. However, it should be pointed out that special training is required in order to become competent in using it.

WORK SIMPLIFICATION IN THE DIETARY DEPARTMENT[1]

MARION J. WRIGHT

Associate Director, Harper Hospital, Detroit

What is work simplification? Work simplification is the organized application of common sense to find better ways of doing work. It is a program that should appeal to all because it seeks to make use of the individual and collective brain power of everyone in an organization. In most organizations, it has always been practiced. With many of us it has become a part of our everyday life. We are always trying to find a better way.

Work simplification is not new. In fact, it is quite possible that many of you have heard everything which will be discussed here. But work simplification brings together in an organized way the principles about which you may already know. When each one recognizes these principles and in an organized way makes them a part of her everyday job, great progress will be made in saving time, energy, materials, and waste of skills.

The better way does not mean "speed-up." It means eliminating the unnecessary parts of the job. In contrast to this, work done in a hurry is the speeding up of all parts of the job, both necessary and unnecessary, and results in waste. The story is told of an eminent surgeon who was called in to perform a delicate operation on a famous and important gentleman. It was an emergency—time was of the essence. Just as the surgeon was about to operate, he turned to his assistant and said, "We have no time to lose, so let's not hurry."

Our objective is to provide a better service to our patients and to improve working conditions by developing a better way of doing work. Two major hospital problems are shortage of trained personnel and increased hospital costs.

How can we hold the line on costs and maintain our present standards of patient care? How can we continue to staff our present hospitals in the face of the personnel shortages? Not by lowering the quality of our service, not by reducing wages, but by improving our methods. We must concentrate on eliminating red tape and the waste of time, energy, materials, and skills. We must use the skills of our professional personnel only for those duties that demand their skills.

How do we find a better way? One approach is through work simplification, the principles of which have been presented in this JOURNAL (1–3). Briefly, they consist of the following steps:

I. Pick a job to improve. Look for jobs giving trouble.
II. Break down the job. Write down every detail.
III. Challenge each detail.
  A. *What* is its purpose? Eliminate unnecessary details.
  B. *Why* is it necessary?
  C. *Where* should it be done? Combine details when practical.
  D. *When* should it be done? Change for a better sequence.
  E. *Who* should do it?
  F. *How* should it be done? Simplify all necessary details.
IV. Work out a better method.
V. Apply the new method.

THE HARPER HOSPITAL PROGRAM

Everything we have done in our project at Harper Hospital has been tested and evaluated in a controlled area before general application. Before describing how the program works, perhaps it would be of interest to you to know how it began. Two years ago, a study was started at Harper Hospital, the aim of which was to find ways and means to staff all of our beds, yet give patients adequate care in the face of personnel shortages, particularly professional personnel in most departments. Expert advice was sought and we came to the realization that no one department could be studied alone. They were too interdependent, and a hospital-wide study was necessary.

[1] Presented at the 35th Annual Meeting of The American Dietetic Association in Minneapolis, on October 23, 1952.

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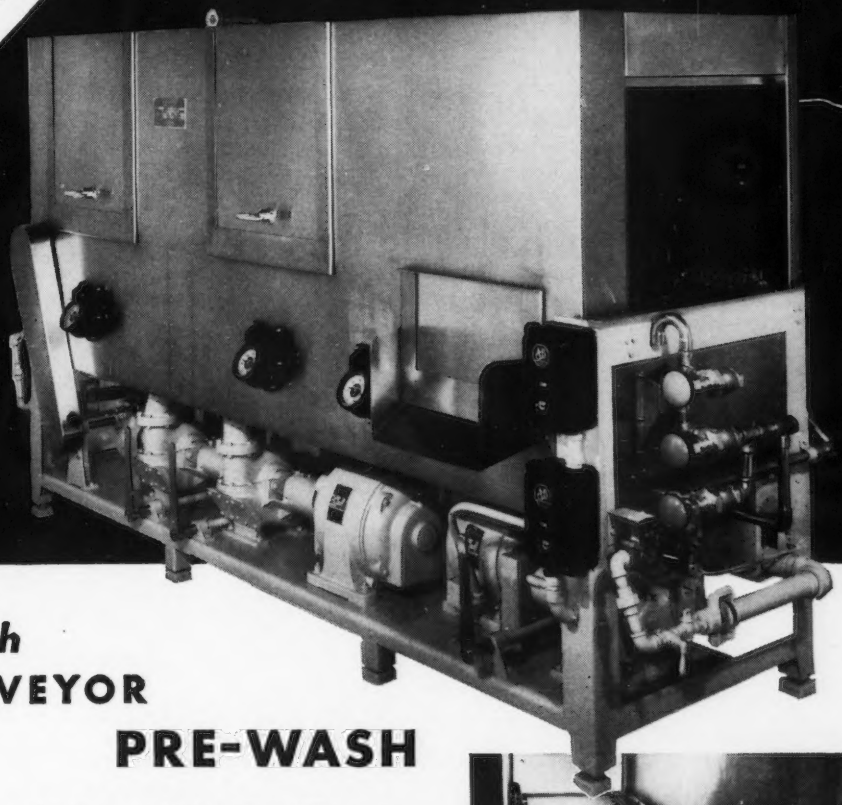

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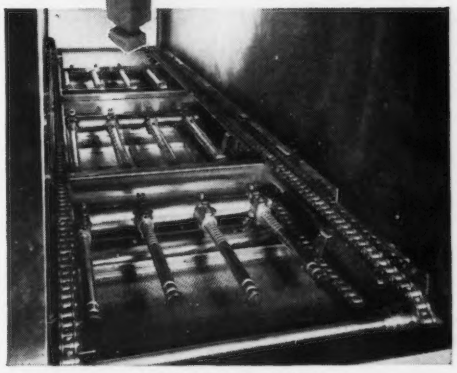

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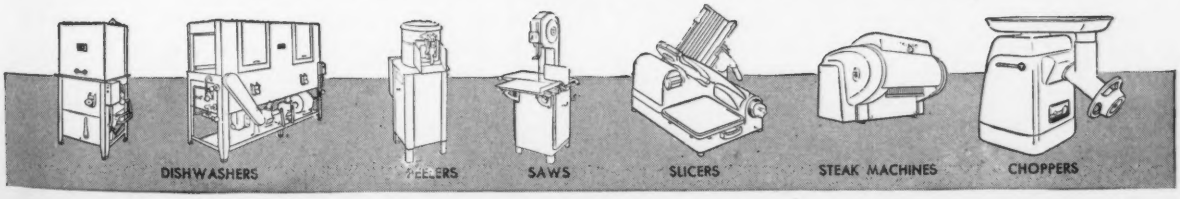

An organization was set up which consisted of an advisory committee consisting of representatives from hospital administration, nursing, dietetics, institutional management (the manager of the Women's City Club in Detroit), housekeeping, business, lay public, education, and medicine.

The real work committee, called the Technical Committee, was made up of people on the job—nurses, a dietitian, the housekeeper, a maintenance man, and so on. They worked out detailed plans to present to the Advisory Committee and department heads. This committee soon realized that a change in one department had far-reaching effects in another, also that someone else might have some excellent suggestions to make about another department.

A director was appointed to coordinate the study.

We were interested in: what we had to do, why it was necessary, how it could best be done, who should do it, and how much time it took to do the work.

There was an awareness that highly skilled personnel were performing duties which did not demand their skills and abilities, especially in the areas where great personnel shortages existed. The questions were: "What can safely be delegated to the nonprofessional?" and, "What department can best do it?"

We knew that when industry had been faced with similar problems, it turned to the industrial engineer to apply his knowledge of methods improvements, standards, and work simplification. We were fortunate in obtaining assistance from the Detroit Chapter of the Society for the Advancement of Management. A volunteer committee from that organization has been working with us for two years.

The study has embraced many surveys of personnel, doctors, patients, activity analysis of patient units, time studies on patient units, and a study of functions of personnel in all departments.

SURVEY OF DIETITIANS' WORK

One of these surveys I would like to discuss in more detail. Questionnaires were sent to hospitals throughout the United States and Canada to learn to whom various activities are assigned, not only to what department, but to whom in the department.

Most of the items we inquired about were those closely related to actual bedside care of the patient and where there might be interdepartmental relationships. Of the 500 items, about 59 could apply to the dietary department. As we said, at this time we were not interested in how the soup was cooked, but how it got to the bowl, to the patient, and the soiled bowl back to dishwashing; also a few indicative items that could be done by someone other than a dietitian that she might be performing.

Returns were received from 49 hospitals in 22 states, and we found some very interesting things dietitians were doing. For example:

DUTIES DIETITIANS PERFORM	PER CENT OF DIETITIANS
Writing census sheets	4
Making out diet slips	62
Copying daily slips	83
Feeding patients metabolic diets	32
Feeding patients pediatric diets	20
Storing food	41
Distributing food to patients	46
Preparing formulas	24
Clerical aspects, requisitions	42
Silver polishing	7
Cleaning steam tables	7
Filling sugar bags	9
Collecting soiled trays	2

These are examples of the types of duties professional personnel were performing that do not require their skills and abilities. I wonder, had we listed all of the activities in a dietary department, how many more we would have found.

In studying functions considered to be those of a good department head, where there is good administration and planning, we found that many directors of dietetics did not always perform these functions. For instance:

DUTIES OF DIRECTORS OF DIETETICS	PER CENT PERFORMING DUTIES
Job analysis	2
Preparing budgets	22
Establishing departmental policies	44
Research	18
Establishing food standards	78
Determining job duties and procedures	40
Explaining and enforcing rules	38
Developing departmental organization	44

This is just a sampling of managerial functions, but if more time were spent on functions of this kind and less on duties that could be assigned to others, would we not have better methods, more economically run departments, better service to the patient, and more job satisfaction?

Is the dietitian so busy doing small things that she does not have time to analyze, plan, organize, train, and supervise, which are primary functions when heading up a department? For instance, out of the 49 hospitals, 14 dietary departments had *no* clerical assistance. Only 3 of the directors of the dietary departments reported having secretaries; 8 had one clerk.

Most dietitians are familiar with the new trend of using the dietary aide, who can—if properly trained—check supplies; write requisitions; check and report census; make out time schedules, attendance reports, and payroll; check routine tray lines; post orders; change diets if necessary; make charge

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slips; do detailed kitchen supervision; and perform many other duties. Yet, although in the 49 hospitals answering, 25 stated they had dietary aides, from the functions assigned to them, in reality in most instances they were ordinary maids.

Why not utilize this person? We have a very active group of 14 dietary aides and only 8 professional dietitians, plus the dietetic interns. Yet, I know of two hospitals comparable as to size and type, one having 22 dietitians and the other 21. They also have dietetic interns. With better utilization of professional skills, would we not be helping to reduce the shortage in the field?

Nursing has gone through this with the practical nurse program. At first, nurses were unwilling to accept the nonprofessional. We received many criticisms of our aide program. Change the word dietitian to nurse, aide to practical nurse, and they are the identical statements nurses made at the beginning of the practical nurse program; some still make them. But on the whole, that program has been implemented throughout the country and with success. In many areas, nursing now says that it cannot get along without the practical nurses.

MANAGEMENT COOPERATION NECESSARY

It was recognized that no work simplification program would be successful without the full understanding of top management. Improvement must start at the top.

Our management consultants planned a series of classes in work simplification, 12 hr. in all. It was first given by two members of this group to administration and top department heads, including the director of dietetics and the administrative dietitians.

The next step in the program was for the consultants to train three of our personnel to teach these classes. Two nurses and a dietitian were chosen and prepared as trainers.

The third step was conducting classes for anyone in the institution who may be classed as supervisory personnel. This included dietitians, dietetic interns, and dietary aides. You might be interested to know that our consultants felt it advisable not to have like people teach each other; therefore, the dietitian has been teaching nursing personnel, and so on, the feeling being that the instructor would have a more objective viewpoint and would need to do more asking *why*, which would assist the students in developing a more questioning attitude. We have found this highly successful.

Classes, of course, were only one facet of the plan. There was a need to develop an organization to follow through on the project and carry out a program so that proposals might be put into reality and a systematic study of procedures be conducted.

A management committee has been formed with wide departmental representation—dietetics, nursing, housekeeping, maintenance, and so on. In fact, it is a continuation of the Technical Committee of the project.

Proposals for improvements are made in duplicate, one copy sent to the department head and one to the committee. After discussion and investigation of savings, costs, and other facets, the committee recommends or rejects the proposal. Committee action is needed because we found most projects affect more than one department. The next step is to obtain department head and administrative approval. The last steps are education of personnel to the change and installation. If a project is rejected, the person submitting it should be told why, so as not to stifle initiative.

Most people, I think, visualize all types of new equipment, conveyor belts, and widely publicized physical improvements when thinking in terms of improvement. True, these do play some part, but other methods involve only repositioning of equipment or rearrangement of layout, while still others go into the realm of reassignment of function, such as dietary aides. Another good example of this is:

Nursing personnel were unloading dumbwaiters, passing trays, collecting trays, and loading dumbwaiters (we have central tray service). In our area, we have an acute shortage of personnel who can give bedside care, but we can easily hire maids. Teams of maids under dietary supervision now go to the units starting on the top floor, unload the dumbwaiters, pass trays out, and go to the next floor. After all trays have been served, the maids return to the top floor, collect the trays, load the dumbwaiter, and so on. Nursing still prepares the patient to eat, feeds the patient, and sees that he eats, but the dietary department has assumed 65 per cent, by time study, of the time spent on serving food in the units. Major results are: the patients receive hot food, because as nursing personnel became shorter, trays were served more slowly; dirty dishes are returned to dishwashing sooner; and delays and overtime in that department have been stopped. Only 19 per cent of the hospitals answering the questionnaire stated that dietary maids performed this function.

SIMPLIFICATION IN OTHER DEPARTMENTS

Other examples of work simplification in the hospital are many. Here are a few in other departments that affect dietary service:

(a) The general messenger service.

(b) Pharmacy delivery service.

(c) Unit packaging of pharmaceutical and stores supplies.

(d) Stock-piling of equipment and supplies in work areas to eliminate constant "running after things."

Two others that do not affect dietetics, but the principles of which could be applied are:

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It's disheartening to a Dietitian on large feeding operations to have her carefully planned and well-thought-out meals reach their destination cold and flat-tasting. AerVoiDs please Dietitians by providing a means by which hot foods and liquids can be kept hot without expensive steam tables until ready to serve.

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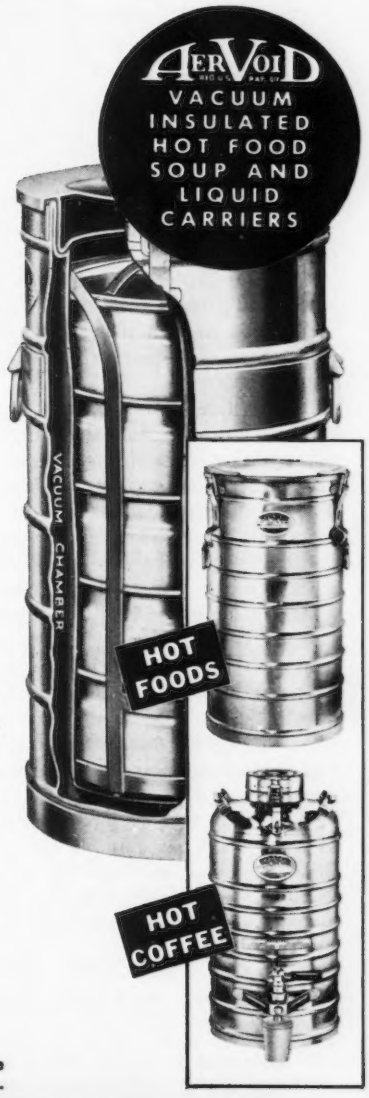

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I. The operating room pack-making room.
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   B. Realigning work area to provide for straight-line production flow, thereby allowing more work to be done in the area with fewer employees. We have always needed a separate area to make obstetrical packs. This operation has now been moved to the one pack room. We are still in the process, but think we can eliminate three jobs.

II. The ward clerk job and nursing station. In this project, now under way, we plan to set up a work area for the ward clerk to eliminate unnecessary motion, travel, and loss of time or energy. It is also involving a study of forms, requisitions, and so on.

CONCLUSIONS

Cooperation from your administrator can be obtained if:

(a) You present your problem clearly and concisely and present concrete facts.

(b) You have a plan in writing.

(c) You demonstrate savings or benefits which will result.

Just telling him that you need a clerk will not produce approval. List the things a clerk can do and what you can do with the time saved. Administrators are human. They want to improve service to patients. They want the institution run efficiently. If they seemingly show no interest in your department, what is the reason? Have you tried to create an interest in a way that will make him listen?

Any program of this type must be a cooperative venture of everyone in an organization. We have held the thesis that everyone is important to the care of the patient whether she gives a medicine or peels a potato.

No one group can work alone; joint committees and cooperative planning on a hospita'-wide level are necessary.

We do not feel we have found all the answers to today's problems, but we think we have some of them. Let me conclude by quoting, "Behold the turtle, he who sticks his neck out makes progress, he who holds it in stands still!"

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(1) Rosa, E., Jr.: Work simplification—a tool in reducing food costs. J. Am. Dietet. A. 27: 952, 1951.
(2) Speckler, J. C.: Work simplification as a tool of management. J. Am. Dietet. A. 24: 598, 1948.
(3) Schmid, M. D.: Work simplification—making the job easier. J. Am. Dietet. A. 24: 1062, 1948.

WORK SIMPLIFICATION AT WORK[1]

MARY M. HARRINGTON

Assistant Director, Harper Hospital, and Director of Dietetics, Harper Hospital, Detroit

Many dietitians participated in the Training Within Industry programs during the war and have heard and read many reports on work simplification. Many of these programs have been presented from the point of view of industry and were not adapted to hospitals. This thinking has been applied more recently to institutional kitchens. At Harper Hospital, a study on work simplification was applied to the institution as a whole, and it sought to use the thinking of both supervision and personnel.

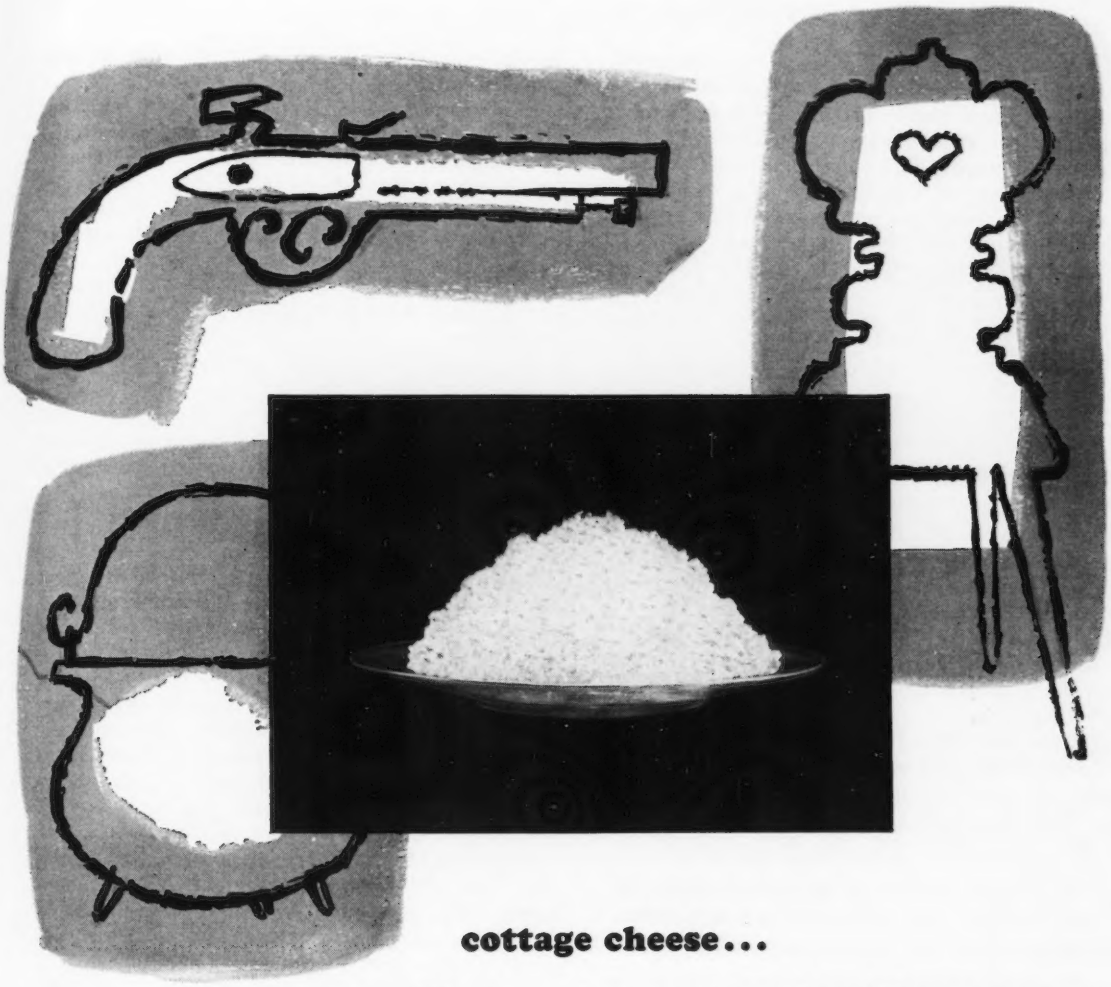
The method of setting up a dietary aide program has been presented in this Journal (1). The thinking behind it was to provide more supervision, at the same time releasing the staff dietitians to function in the manner for which they were trained. To make such a program effective, both the dietitians and the aides needed to have a unified philosophy.

With the introduction of the work simplification program in the entire hospital, it was necessary to have the same thinking on a broad scale throughout the various departments. How could this viewpoint be achieved? In the dietary department, work simplification operates as follows:

To learn how to study a job and make a process flow chart, the director of dietetics, the administrative dietitian, and a staff dietitian who was to be trained as a group leader attended the series of conferences on work simplification given by an instructor of the Society for the Advancement of Management. These conferences were attended by representatives from the various other major departments of the hospital. All of the group worked on a problem, even though it concerned only the dietary department. It was soon apparent that nursing, maintenance, and other departments were either concerned or had suggestions that would simplify our problem. It also gave a common approach in studying the problem.

Our next step was to have the staff dietitians attend conferences conducted by a nurse as the leader. The nurse chosen was an excellent leader, and because she was not familiar with our problems in detail, she could ask many questions which stimulated thinking. One improvement which resulted from this group study was a revised daily diet sheet, which reduced the copy work and improved the accuracy for both the nursing and dietary departments. This diet sheet was designed for use in a unit serving a large number of semi-private patients. Since then, a request has been made by other units for a similar plan.

[1] Presented at the 35th Annual Meeting of The American Dietetic Association in Minneapolis, on October 23, 1952.



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frequently gracing the Colonial farmer's table • still occupying a major place in the American diet • a "homey" sort of food with a thousand and more uses • cottage cheese . . . one of the first solids many babies thrive on • a regular, almost taken-for-granted staple for the older "touchy" digestion • so familiar a favorite for such unfamiliar reasons • reasons? • plenty of them • easier to digest because of its low fat content • acidified by carefully selected bacterial "starters" to form curds soft and fine • high protein but low calorie • like buttermilk, an excellent source of "friendly flora" which promote normal digestion and elimination, especially in the presence of certain gastrointestinal disturbances • added to all that, the merits of a Borden quality product • only the finest, freshest pasteurized milk skimmed and incubated • the curds cut, drained and washed under the most hygienic conditions • cream and salt added to bring out the most pleasing flavor • and from processing to packaging, Borden's quality controls rigidly applied to assure uniform goodness and wholesomeness • it is this traditional concern for quality that has made people everywhere realize . . . "If it's Borden's — it's got to be good."

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It was felt that this program would be valuable in the training of dietetic interns and was conducted by the same nurse leader. The interns offered many suggestions for improvements which would save footsteps and simplify details in their area of training. All of these have not been developed at present, but the cost of the changes is being studied. One simple change, recommended by the interns, only cost $28 and saved time and footsteps. It was the insertion of a mailbox slot between the office of the therapeutic dietitian and the adjoining formula room. Formula orders can be removed from the tube and dropped through the slot into the box, and the intern does not need to leave her desk and the maid does not leave the formula room.

SUGGESTIONS FROM DIETARY AIDES

The next group whom we felt would need the conferences were the dietary aides. The same program was followed with the same nurse leader. Following are some of the proposals submitted by this group:

(a) Re-location of the ice cream storage cabinet and toaster nearer the tray service table and dumbwaiter. This change has been made and is a decided improvement.

(b) Improved method of transporting dishes from the dumbwaiter in the service room to the cafeteria counter.

(c) Building a shelf in one unit kitchen to improve the physical arrangement and save footsteps in serving trays.

(d) An improvement in the method of dispensing beverages in the snack bar and in clearing tables, which saves time and motion for the maids.

IMPROVEMENTS IN TRAY SERVICE

The department started to study food service problems with patients, realizing the critical shortage of nursing personnel. A joint committee of head nurses and unit dietitians developed a written plan for tray service which was tested in one unit. After it had been functioning for a month, the committee met to review the results. The joint committee felt the plan was successful and recommended that it be used on all units. Nursing and dietetics administration accepted the recommendations and instituted and implemented them. The change in tray service has been well accepted by the floor nurses and by patients.

It was decided to have the nursing department prepare the patients for their meals and to have the trays served to the patients' bedside by dietary maids. These maids were trained as to how to approach a patient and given a *written* outline of their duties. This plan has created no problems and has assured the dietary department that the patients are receiving hotter food. It has also relieved the nursing department of an activity which required considerable time.

In the process of this study, it was found that drinking glasses and mouth wash glasses were being washed on the floors by ward aides. Now all glasses are sent to the dishwashing units to be washed in the glasswashers. The trays of clean glasses are sent to the floors once daily, based on the needs. The amount is calculated as three glasses per patient. This relieves the nursing personnel, which should rightly be done, and the use of glasswashers assures better sterilization.

The installation of a trayveyor in an antiquated kitchen was expensive but necessary. It was planned to give as straight a production flow as possible. With it, we now serve 150 trays in a much shorter time without the addition of more personnel, even though the patient census has increased.

LABOR-SAVING DEVICES

In a work simplification program, labor-saving devices should always be investigated. Employees are often resistant to change and must be taught that the device will make their work easier. A new type of divider which would fill twenty-four ice cream cups simply by turning a crank handle was purchased. This divider eliminates hand-dipping. But, it took constant supervision for two weeks to teach the employee to use it properly and to convince him that his job would be easier. Now he is showing the device with pride to every visitor.

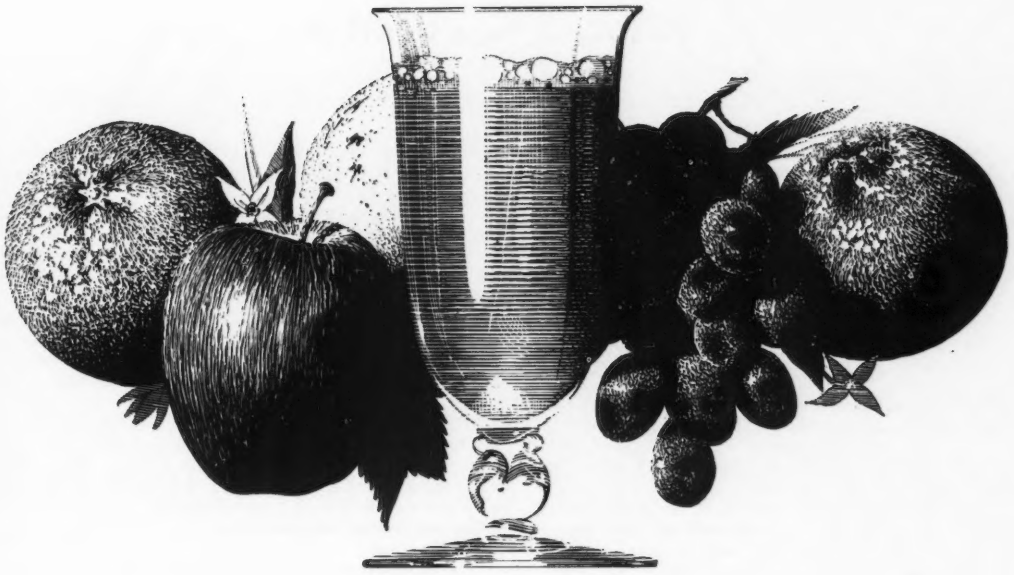
Another innovation is the use of an Addressograph plate which is sent with the patient's admission forms to the floor, where it is used to reduce much of the writing on laboratory and other forms. The location of the machine instigated a rearrangement of the nursing station. As an outgrowth of this change, it came to the attention of the nursing department that a revision of the special diet order was advisable. This revised slip was used in one unit and at another meeting was evaluated. It saves writing, reduces errors by the ward clerk, and is now being used throughout the institution. This form is used for all therapeutic or "special diet" orders and saves much writing by the ward clerk in addition to giving legible, accurate information.

Work simplification in our department has developed a point of view and interest in studying procedures to see if they can be simplified. It has served to bring a mutual interest and understanding among the various departments. This program does not mean an extravagant expenditure of money, but is a method of improving labor relations as a result of improved working conditions.

REFERENCE

(1) HARRINGTON, M. M.: Dietetic mobilization in the national emergency. 2. A dietary aide program. J. Am. Dietet. A. 27: 636, 1951.

Juices need this advantage



Did you know that ascorbic acid may be added to certain fruit and vegetable juices to standardize their vitamin C content, thus overcoming wide variations which can occur *(see table below)*. Many nutritionists believe that the public interest is best served when the ascorbic acid content of processed juices is so standardized. A label statement of 100% of the minimum daily adult requirement may be made when a juice serving contains 30 mg. of ascorbic acid.

When a food processor improves his juice by raising or standardizing its vitamin C content he merits your support. If you wish information about good juices which are now made better through the use of Roche ascorbic acid, please write to the Vitamin Division.

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Below are examples of minimum and maximum levels of ascorbic acid in commercially canned juices. Note the wide variations! All figures are in milligrams per 100 grams of juice. Data from U. S. Department of Agriculture.

	Min.	Max.
Grapefruit juice	10.0	49.0
Orange juice	9.7	70.0
Pineapple juice	5.4	18.0
Apple juice	0.2	3.6
Grape juice	0.0	4.7
Tomato juice	2.5	32.0

It is in the public interest to standardize the vitamin C content of these processed juices and juice products.

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Grape — Pineapple — Cranberry — Tomato
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Book Reviews

Domestic Food Consumption and Expenditure, 1950. With a Supplement of Food Expenditure by Urban Working-Class Households, 1940–49. Annual Report of the National Food Survey Committee, Ministry of Food. London: Her Majesty's Stationery Office, 1952. Paper. Pp. 131. Price 4s. 6d. net.

The National Food Survey in Great Britain was initiated by the Ministry of Food in 1940. From this date until 1949, the survey was limited to urban working-class households and was used for control of the plan for rationed food. The first report, covering the period 1940–49, was published in 1951.

The 1950 survey, reported in this bulletin, was planned to provide a sample of a cross-section of the entire population. Information on both nutritive quality of the diet and on the cost of food is included, as is an analysis of food costs for 1940–49, not included in the previous report.

It is not possible in a brief review to describe in detail the numerous data presented, since the authors have summarized much of the material in sixty-eight well organized tables (inclusive of Appendix and Supplement) and the entire publication is a model of condensed, concise information. Comparisons are made of the kinds and amounts of specific foods used, contribution of various foods to the total intake of specific nutrients, and the cost of food for families of varying income.

It is of interest to compare the distribution of nutrients and the cost of the British diet with similar studies made in the United States. In spite of limited food supplies and strict rationing of many foods in Great Britain, the nutrients available to households made up of old-age pensioners and others of restricted social class compared very favorably with those consumed by households of higher social class. This is in interesting contrast to the data reported by Stiebeling (J. Am. Dietet. A. 26: 596, 1950) that power to buy is still a controlling factor in being able to obtain an adequate diet in the United States.

Carefully documented records of the food intake of a population, such as we find in this bulletin, are invaluable to those concerned with long-time planning of food needs, especially for emergencies affecting large populations.—*Margaret A. Ohlson, Ph.D., Head, Department of Foods and Nutrition, Michigan State College, East Lansing.*

The Low Sodium Cook Book. By Alma Smith Payne and Dorothy Callahan. Boston: Little, Brown & Company, 1953. Cloth. Pp. 477. Price $4.

This is one of a number of books to appear recently as a guide to the patient who must observe restrictions of sodium, cholesterol, and/or fat. Fundamental considerations in planning the low-sodium diet and the low-cholesterol diet are reviewed. The authors emphasize the importance of using the diet, and this book, only under the guidance of a physician.

Chapter headings such as "Of Herbs and Greens and Seasonings," "Have You Spirits in Your Kitchen?" "Soup's On," "The Meat's the Thing," "With a Cruet in Each Hand," "Taste-Ticklers," "You Can Take It with You," "Tips on Trips and Eating Out," and others suggest the wide variety of ideas presented. Unquestionably, the authors show both discrimination and imagination in the adaptations of recipes for the restricted sodium diet.

The clearly written, family-size recipes include ingredients which for the most part are readily available and economical. Low-sodium milk is specified in place of regular milk so that recipes may be used for the more restricted levels of sodium. In recipes which customarily require salt, the authors recommend that the dieter add a salt substitute at the end of the cooking period, and that others in the family group add salt. Whether all patients may indiscriminately use salt substitutes is by no means certain. The authors state that these products should be used only with a physician's prescription, but many readers may miss this warning. It may be questioned whether the use of salt substitutes should be suggested at the end of each recipe.

Each recipe includes information on the sodium, fat, and caloric content of one serving and of the total recipe. However, the calculation of sodium values to the tenth of a milligram implies a precision which is not attainable with the variability of food composition and the limited number of sodium determinations which have been made on any given food.

The appendix includes tables on the sodium, cholesterol, and fat content of household measures of common foods; a list of available commercial low-sodium products; sodium content of water-packed fruits; a summary of the sodium content of recipes in this book; sodium content of water supplies; and sodium content of California wines.

This book will be a helpful guide to the patient who takes the time to adapt intelligently the many fine suggestions and recipes to his particular regimen. It is likewise a useful reference for the physician and dietitian.—*Corinne H. Robinson, Professor of Nutrition, Temple University School of Medicine, Philadelphia.*

Standards of Care for Older People in Institutions. Section I. Suggested Standards for Homes for the Aged and Nursing Homes. By the National Committee on the Aging of the National Social Welfare Assembly. New York: National Social Welfare Assembly, 1953. Paper. Pp. 112. Price: $1 per single copy.

This 112-page bulletin is a godsend to anyone concerned with establishing, reviewing, interpreting, or understanding standards for institutions for aged or ailing persons. It is the result of a project made possible by a grant from the Frederick and Amelia Schimper Foundation, directed by Edith Alt, and completed with the participation of an imposing group of outstanding people in the geriatric field.

This report is not a "model" which could be taken verbatim in setting state standards, because it is not always sufficiently definitive where legal strength is necessary. However, the report presents desirable standards, trends in handling and treating people, and the reasons. The point of view is that of the patient or resident and his needs rather than the exact characteristics of the facilities provided for his care. Under "Needs and Services," there is a chapter on "Food and Food Service." In the section on plant and equipment, desirable kitchen equipment and facilities are described; however, both are in rather general terms.

There is a bibliography and a list of resources for standards, in both of which the interest and materials of The American Dietetic Association are recognized.—*Vera W. Walker, Director of Cafeteria, Federal Reserve Bank, Jacksonville, Florida.*

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Current Literature

Contributed by Mildred Bonnell and administrative dietetic interns, University of Washington, Seattle; Janette C. Carlsen and Ethel M. Miller, The Johns Hopkins Hospital, Baltimore; Jacqueline Fitzmorris, Dietetic Intern, Veterans Administration Center, Los Angeles; Elizabeth H. Tuft, Wesley Memorial Hospital, Chicago; and the Journal staff

AMERICAN JOURNAL OF DIGESTIVE DISEASES

Vol. 20, May, 1953

* Nutrition and blood pressure. C. M. Wilhelmj, J. McDonough, and H. H. McCarthy.—p. 117.

Nutrition and Blood Pressure. In human subjects and experimental animals it has been conclusively shown that an increase in body weight elevates blood pressure. In human subjects, it has not been proved whether body weight per se or the dietary constituents naturally chosen by the obese patient is the direct causative influence on the blood pressure. In normotensive and hypertensive human subjects and dogs, most of the evidence indicates that high-protein diets do not elevate and low-protein diets do not decrease blood pressure. In rats, the blood pressure is directly affected by protein intake and evidence suggests the synthesis of ACTH may be the link in these species. The available evidence indicates that carbohydrate and fat influence blood pressure only insofar as they influence body weight. High sodium chloride ingestion, combined with an otherwise normal diet, does not cause significant elevation of blood pressure in normal dogs, but does elevate the blood pressure of rats. In some human patients with hypertension, restriction of sodium intake causes a marked lowering of blood pressure, in others, it is not affected. It seems likely that those patients who show a lowering of pressure with salt restriction belong to a group where overactivity of the adrenal cortex is the causative factor.

THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES

Vol. 225, May, 1953

* Chronic atrophic gastritis: symptomatic proclivities. E. D. Palmer.—p. 501.
* Antagonism and addition from combinations of aureomycin and penicillin in the treatment of of pneumococcic infections in mice. G. G. Jackson, M. H. Lepper, J. Seto, and H. F. Dowling.—p. 525.

Chronic Atrophic Gastritis. Seventy patients with a gastroscopic diagnosis of chronic atrophic gastritis were thoroughly studied in an effort to uncover coexistent disease. Thirteen cases were without upper gastrointestinal complaints. In all but six, explanations as good as or better than gastritis were found. Despite the importance of atrophic gastritis in production of achlorhydria, gastric polyps, and carcinoma, for the most part atrophic gastritis could be considered a subclinical disease in these patients.

Antibiotics in Pneumococcic Infections. Aureomycin and penicillin in combination were administered in a single dose to mice with Type I pneumococcus. Analyzed results indicated that aureomycin caused both an antagonistic and an additive effect on the therapeutic activity of penicillin. When the ratio of penicillin protection to aureomycin is high, conditions are favorable for antagonism. When the ratio is low, significant addition from combined use of the two is likely.

THE AMERICAN JOURNAL OF NURSING

Vol. 53, June, 1953

* A job application is a compliment. H.E. Davis.—p. 706.

Courtesy to Applicants. Perhaps fewer un-businesslike letters of application would be written if employers replied courteously, correctly, and promptly to requests for positions. Employers should be concerned about the impressions they give applicants and should realize the obligation of answering requests. Stock "brush-off" phrases are discouraging; if no opening exists, a courteous explanation is appreciated. Placement services, moreover, cannot do their best if employers do not supply such information as a complete job description, personnel and salary policies, and the exact time when a position will be open. With such cooperation, a placement service can bring employers and employees together with greater speed and satisfaction.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 43, May, 1953
Part I

* The importance of food in preventive medicine. C. A. Elvehjem.—p. 523.
* Brucellosis, diabetes, and liver deficiency. A. P. Leon and N. Aguirre.—p. 539.
* Public health aspects of electronic food sterilization. J. T. R. Nickerson, B. E. Proctor, and S. A. Goldblith.—p. 554.

Part 2—Year Book 1952–1953

* A survey of coliform organisms in ice cream. Committee on Research and Standards.—p. 76.

Nutrition in Preventive Medicine. Because of the crowded medical curriculum and also because of the rapid advances in nutritional research, much of the physician's education in the field of nutrition must come after he has finished medical school. In spite of these difficulties, it is believed that if the average medical practitioner would use the present knowledge of nutrition effectively, a tremendous step would be taken in preventive medicine. Private physicians can probably do more to improve food habits than any other group. Perhaps such a program should be called "optimum nutrition." The importance of nutrition in pellagra, diabetes, colitis, peptic ulcer, and anemia is well known. Some of the fallacious beliefs regarding dietary treatment are pointed out, such as the complete removal of certain types of food before there is adequate proof of the need for such drastic action. Food faddism and bad dietary practices thrive on half-truths and speculations; therefore, vigilance on the part of doctors, nutritionists, lawmakers, and the general public must be employed to overcome the evil that mistaken information may impart. Typical nutritional problems for various age groups are given as examples of the way the physician may use his own knowledge of nutrition or that of dietitians and nutritionists cooperating with him in a positive nutrition program.

Effects of Brucellosis. The possible existence of a causal relationship between brucellosis and diabetes, and brucellosis and liver deficiency with or without diabetes was investigated. Of the cases of brucellosis studied, 67.7 per cent also had diabetes and 76 per cent had liver deficiency. Both diabetes and liver deficiency were found in 61.4 per cent of the cases. These findings indicate the improbability that the association between brucellosis and the other conditions can be due to chance. Rather they point to the conclusions that brucellosis may be a cause of diabetes and liver deficiency, that diabetes and liver deficiency are frequent complications of brucellosis, and that in cases of brucellosis, it is necessary to make a careful search for diabetes and liver deficiency in order that these conditions may be treated.

Electronic Food Sterilization. During the last seven years it has been shown that all kinds and types of microorganisms can be destroyed with ionizing radiations. Whereas radiations of this kind frequently produce undesirable flavors in foods, there are indications that these changes may be prevented by the incorporation of certain chemical compounds. Before this method of sterilizing food can be approved by government agencies for commercial use, extended toxicologic studies are necessary. It has been found that water, sewage, and antibiotics can be sterilized with ionizing radiations. Another possibility of great promise is the use of ionizing radiations to sterilize human organs removed from fresh cadavers in order that they may be

the *breads of today* and *yesterday*

A STORY OF PROGRESS IN NATIONAL NUTRITION

Contrary to a widely prevalent fallacious assumption, commercial white breads of today offer more, not less, of nutrient essentials than either commercial or homemade breads of former years, even as recently as 1930.

Commercial white breads of today are almost universally enriched with B vitamins and iron, and contain substantial amounts of nonfat milk solids.[1,2] Breads of yesterday contained neither added vitamins and iron nor nonfat milk solids.

Conforming to government requirements,[3] commercial enriched breads of today provide per pound not less than 1.1 mg. of thiamine, 0.7 mg. of riboflavin, 10 mg. of niacin, and 8 mg. of iron. White breads of yesterday contained only insignificant amounts of these important nutrients.

Containing generous amounts of nonfat milk solids,[1] averaging 4 pounds per 100 pounds of flour, commercial breads of today provide flour protein supplemented with milk protein. Hence the protein of today's commercial white breads is notably superior biologically to the protein of yesterday's breads,[4] being in itself biologically effective, thus contributing to maintenance of body tissue and growth promotion.

Due to the calcium contained in nonfat milk solids and in other ingredients of the baking formula, commercial breads of today supply also significant amounts of calcium—about 400 mg. per pound.[5] Breads of yesterday, without these elements, furnished little of this nutritional essential.

Because of this notably high content of essential nutrients, bread—in generous amounts—deserves inclusion in every meal.

1. Flour and Bread Enrichment, 1949-50: Prepared by The Committee on Cereals, Food and Nutrition Board, National Research Council, Washington, D. C., 1950.
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The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

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held for subsequent transplanting. It is believed that other important aspects of these investigations may be developed in the future.

Coliform Organisms in Ice Cream. The presence of coliform organisms in frozen desserts indicates poor sanitary practice in the handling of the dairy products used. Two methods for determining the coliform content of ice cream are described, together with advantages and disadvantages of each. Although no coliform standards for the product are set, the over-all findings indicate that the incidence of the organisms in ice cream is higher than in pasteurized milk and that efforts should be made to improve this record.

ARCHIVES OF PEDIATRICS

Vol. 70, April, 1953

* Domestic water fluoridation. Its pathogenic potentialities. W. J. McCormick.—p. 114.

Domestic Water Fluoridation. Fluoridation of domestic water is a poor substitute for better nutrition. When major dependence is placed on such measures, public interest in good food habits and oral hygiene is sure to suffer. There are situations where high levels of fluoride cause toxic effects. Small doses (5 to 10 gm.) of certain innocuous salts of calcium and an optimum intake of foods rich in calcium and ascorbic acid are necessary to neutralize the toxic effects of fluorine.

CANADIAN JOURNAL OF PUBLIC HEALTH

Vol. 44, April, 1953

* Fluorine and dental caries. C. I. Coburn and R. G. Knipe.—p. 111.

Fluorine and Dental Caries. This study indicates a higher immunity to dental caries when fluorides are naturally present in drinking water. The degree of this immunity cannot be accurately measured, and other variables such as racial background, dietary habits, and heredity have not been investigated. The primary objective of the study was to stimulate interest in artificial fluoridation.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 1, April 29, 1953

* Amino acids and proteins, their place in human nutrition problems. N. W. Flodin.—p. 222.

Vol. 1, May 13, 1953

* Broccoli processing, accumulation of alcohol in underscalded frozen broccoli. P. A. Buck and M. A. Joslyn.—p. 309.

Amino Acids in Human Nutrition. Protein-deficiency conditions occur among virtually entire populations in many parts of the world and are to be found in some proportion even in relatively well nourished countries. Nutrition research has shown the vital importance of adequate protein nutrition in promoting optimal growth, muscular development, and resistance to disease in children; in diminishing the incidence of toxemias and premature deliveries in pregnancy; and in maintaining the integrity and health of body tissues into old age. It has also been shown that the nutritive value of proteins depends primarily on their amino acid balance. The four essential amino acids most needed for improvement of human dietaries are lysine, methionine, threonine, and tryptophan. By addition of these substances, many important low-cost foods could be converted to high quality protein sources, probably increasing by 50 to 100 per cent the supply of protein.

Processing Broccoli. To determine the effects of scalding on the accumulation of acetaldehyde, alcohol, and related compounds in broccoli during freezing storage, Italian green-sprouting broccoli was used in various tests. Some samples were scalded in water at 100°C., and after being rapidly cooled were subjected to peroxidase and catalase tests to evaluate the effectiveness of scalding. Other samples were frozen without scalding and stored at −17°C. for six months to one year. Still other portions were scalded in steam and water for various lengths of time, then frozen and stored as above. The scalded samples were found to remain fairly constant in content of volatile aldehydes after storage up to one year. The ethyl alcohol content, however, continuously increased during freezing storage, although in appreciably greater amounts in the unscalded or lightly scalded samples. It appears that, unlike asparagus and peas, ethyl alcohol rather than acetaldehyde content may serve as an objective criterion of quality in frozen broccoli.

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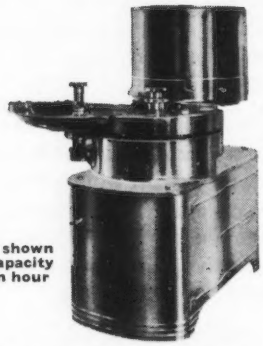

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THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 152, May 2, 1953

* Trends and needs in nutrition. W. H. Sebrell, Jr.—p. 42.

Vol. 152, May 16, 1953

* Trichinosis. Editorials and Comments.—p. 241.

Vol. 152, May 23, 1953

* Loss of taste as toxic effect of methimazole (tapazole) therapy. Report of three cases. B. L. Hallman and J. W. Hurst.—p. 322.
* Effect of vitamin C deficiency on healed wounds. Editorials and Comments.—p. 334.

Nutrition Needs. Although the nation's progress in nutrition during the last few decades has been outstanding, there is still a critical and definite need of a reoriented nutrition program. The areas in which the needs are particularly great are discussed. They include control of obesity, elucidation of the role of nutrition in the chronic diseases, assessment of nutritional status as a step toward control of borderline deficiencies, means for complete intravenous alimentation, and additional knowledge regarding nutrition in the aged, those under stress, and those in convalescence.

Trichinosis Control. At a national conference on trichinosis, held to discuss methods of controlling the disease, two approaches to the problem were explored. The first involves the prevention of trichinosis in man by the destruction of viable larvae of *Trichinella spiralis* in pork before it is consumed, and the second is concerned with the prevention of trichinosis in swine. New methods for accomplishing the first objective are mentioned. Contaminated garbage is perhaps the major source of infection in hogs. The recommended nationwide program for the control and ultimate eradication of the disease includes the passage of state laws requiring that all garbage and offal fed to hogs be cooked at licensed cooking establishments before it can be used as feed. Other measures for controlling the spread of the disease in animals are listed.

Toxic Effect of Methimazole. Loss of taste, or of both taste and smell, has been observed as a toxic effect of methimazole, a generally accepted antithyroid agent. In the three cases reported in this paper, the senses returned when the drug was withdrawn. Several possible reasons for the development of the condition are considered.

Ascorbic Acid Deficiency and Scars. In an experiment conducted in the U. S. Army Medical Nutrition Laboratory, Chicago, scar tissue in adult male guinea pigs was found to be more susceptible to ascorbic acid deficiency than was normal tissue. The study indicates that adequate ascorbic acid intake is essential not only for normal healing in the period immediately following trauma, but also for the maintenance of previously formed scar tissue.

JOURNAL OF AVIATION MEDICINE

Vol. 24, April, 1953

* The effect of moderate altitude upon human gastric emptying time. E. Shocket, M. M. Jackson, and H. C. Dyme.—p. 113.

Gastric Emptying Time. The effect of moderate altitude on the rapidity of gastric emptying has been studied by x-ray in seven human subjects. No significant difference was found between the average emptying time at moderate altitude and at ground level.

THE JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 202, May, 1953

* Effects of a vitamin B_{12} deficiency on liver enzymes in the rat. J. N. Williams, Jr., W. J. Monson, A. Sreenivasan, L. S. Dietrich, A. E. Harper, and C. A. Elvehjem.—p. 151.
* Diet and ergothioneine content of blood. R. C. Baldridge and H. B. Lewis.—p. 169.

Vitamin B_{12} and Liver Enzymes. Weanling male rats were employed as experimental animals in a study of the effects of vitamin B_{12} deficiency on certain enzyme systems. In addition, the effects of the vitamin B_{12} antagonist, *Lactobacillus leichmannii*, were compared with the simple deficiency of the vitamin. Animals suffering from the vitamin deficiency showed significantly less growth than the controls, but the antagonist produced no effect on growth, either in the presence or absence of vitamin B_{12}. The liver enzyme system showed a marked decrease in liver endogenous respiration and in betaine-homocysteine transmethylase and xanthine oxidase activity as a result of a simple vitamin B_{12} deficiency. These observations are discussed with respect to other known facts concerning vitamin B_{12} metabolism.

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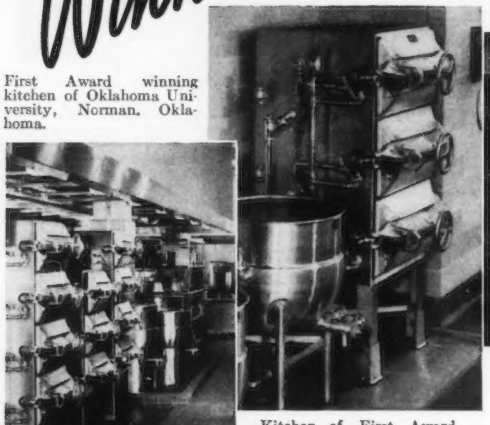

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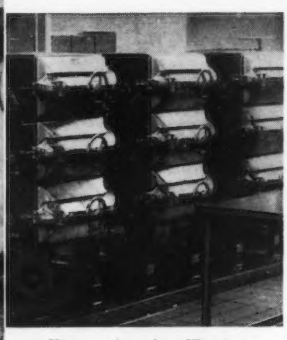

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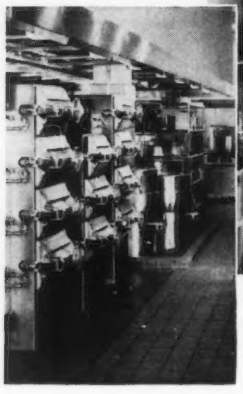

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Although caloric needs in the later decades of life lessen with decreasing physical activity and diminishing metabolic rate, clinical observations[1] corroborated by experimental studies[2] show that protein needs of the aging organism continue at the levels of adequacy in earlier years.[3] For avoidance of protein deficiencies, which the aged are prone to develop,[4] the protein quota of the diet of persons over fifty should be more liberal than is often the practice.[5] In providing this quota, lean meat may well be one of the protein foods of the daily diet.

In the years beyond fifty, as well as before, continuous adequate protein nutrition remains an absolute necessity for maintenance of a normal concentration of plasma proteins and, in turn, a normal osmotic pressure of the plasma.[6] Even more pronounced in the aged than in younger persons are the ill consequences of hypoproteinemia—edema, decreased resistance to generalized infection, retarded bone healing, and poor wound healing.[7] Furthermore, dietary protein is essential for the continuous chemical regeneration of cell protein in the prevention of abnormal tissue wasting, one of the most characteristic and obvious changes in the geriatric patient.[8]

But meat is much more than an outstanding protective protein food in the dietary of persons over fifty. It also supplies generous amounts of the B group of vitamins and of iron, phosphorus, and other essential minerals. In the well-balanced diet of the later years of life, meat is just as important for the maintenance of nutritional and physiologic well-being as it is during the earlier years of life.

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The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

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Blood Ergothioneine. Significant differences are found in the ergothioneine content of the blood of various animals, the amount of the substance being quite high in the pig, for instance, and very low in the rat. Although the biologic origin and function of ergothioneine are still unknown, the relationships between diet and blood levels of ergothioneine in the rabbit and the rat have been studied by means of the Hunter method and the results reported. A four- to sixfold increase in the concentration of the substance in the blood of rabbits was observed when the animals were caged and fed a diet of oats and cabbage for several weeks. On a purified casein diet, consumed for a similar period, a decrease of ergothioneine was observed in the animals' blood. Oral or intraperitoneal administration of ergothioneine to the rabbit or the rat did not result in an increase of the substance in the blood within 24 hr.

JOURNAL OF CLINICAL INVESTIGATION

Vol. 32, May, 1953

* Studies on copper metabolism. IX. The transportation of copper in blood. C. J. Gubler, M. E. Lahey, G. E. Cartwright, and M. M. Wintrobe.—p. 405.

Copper Metabolism. Evidence is presented that copper is present in human, rat, dog, and pig plasma in at least two different forms. The fraction which reacts with sodium diethyldithiocarbamate only after removal of the protein by treatment with hydrochloric acid corresponds to the copper *a*-globulin. This fraction constitutes approximately 96, 99, 88, and 58 per cent of the copper normally present in human, rat, dog, and pig plasma, respectively. The remainder of the copper in plasma is in a form which reacts directly with carbamate reagent, but, like the indirect reacting fraction, is also nondialyzable within the physiologic pH range. In human subjects the hypercupremia of pregnancy and that found in infections, as well as that associated with experimentally induced infections in animals, are due to an increase in the indirect-reacting fraction. The hypercupremia which follows the oral or intravenous administration of copper is due to an increase in the direct reacting fraction.

THE JOURNAL OF CLINICAL NUTRITION

Vol. 1, March–April, 1953

Lack of avitaminosis among alcoholics: its relation to fortification of cereal products and the general nutritional status of the population. W. G. Figueroa, F. Sargent, L. Imperiale, G. R. Morey, C. R. Paynter, L. J. Vorhaus, and R. M. Kark.—p. 179.

Pyridoxine deficiency in the human infant. S. E. Snyderman, L. E. Holt, Jr., R. Carretero, and K. Jacobs.—p. 200.

* Arteriovenous glucose differences, metabolic hypoglycemia and food intake in man. T. B. Van Itallie, R. Beaudoin, and J. Mayer.—p. 208.

* The use of oral high fat, high calorie emulsion for total feeding. W. J. Kuhl, Jr., M. I. Grossman, and C. F. Consolazio.—p. 218.

* Review: The fundamentals of clinical proteinology. C. Tui.—p. 232.

Role of Glucose in Hunger. The glucostatic theory of food intake regulation postulates that, in the normal animal, variations in the blood glucose level exert a regulatory influence on food intake. Experiments on adult human subjects were designed to determine to what extent the theory can account for the desire for food and absence of such desire. In general, it was found that when values for arteriovenous glucose remained appreciable, hunger was never reported, but that when the values approached zero, the condition was ordinarily associated with hunger. While dietary habits and emotions have an unquestionable influence on appetite, they were found to assume less and less importance as caloric intake was increasingly restricted. Starvation, uncontrolled diabetes mellitus, and cortisone hyperglycemia—all displaying a diminished arteriovenous glucose area—were usually accompanied by excessive hunger, suggesting that although the uptake of glucose in the central nervous system generally is not subject to hormonal influence, there may be receptors concerned with food intake regulation that are. In conclusion, the findings support the view that the urge to eat is a homeostatic response to carbohydrate deprivation.

Use of Fat in Liquid Feedings. This study was undertaken to determine whether a high-calorie liquid diet, consisting of a 40 per cent fat emulsion, given as the sole source of feeding, would

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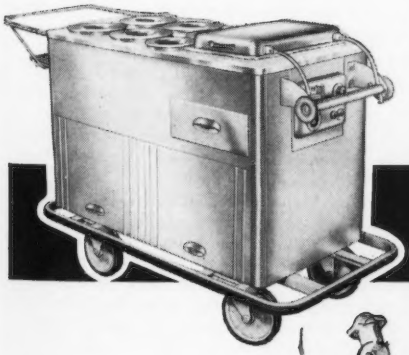

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be accompanied by gain in weight, restoration of positive nitrogen balance, and minimal alteration in normal metabolism. In the past, the usual liquid diet has achieved these ends only with difficulty. Six patients with fracture of the mandible served as subjects. An increase of weight and marked positive nitrogen balance were noted in all subjects. No consistent changes occurred in fasting blood levels of total neutral fat, phospholipid, cholesterol, serum total protein or A/G ratio, N.P.N., fasting blood sugar or carbon dioxide content.

Proteinology Discussed. After a brief presentation of the history of clinical proteinology with an appraisal of its potential developments, the basic concepts in general proteinology are discussed. They include the importance of proteins to the body, the chemical aspects of protein formation, caloric and protein requirements, and their interrelationship in the normal subject. In disease or injury, protein metabolism may be adversely affected in several ways with varying degrees of hypoproteinia. Ways of preventing hypoproteinia in the course of injury or disease and of maintaining an adequate protein state conclude the paper.

THE JOURNAL OF NUTRITION

Vol. 49, April, 1953

*Heat processing and the nutritive value of milk and milk products. L. J. Schroeder, M. Iacobellis, and A. H. Smith.—p. 549.

*Effects of basal diets on the response of rats to certain dietary non-ionic surface-active agents. B. F. Chow, J. M. Burnett, C. T. Ling, and L. Barrows.—p. 563.

Further studies relating liver xanthine oxidase to quality of dietary protein. G. Litwack, J. N. Williams, Jr., P. Fatterpaker, L. Chen, and C. A. Elvehjem.—p. 579.

*The influence of relative humidity upon vitamin deficiencies in rats. R. A. Collins, M. Schreiber, and C. A. Elvehjem.—p. 589.

*The interrelationship between thyroid activity, dietary fat and lipogenesis. B. Kennelly and L. A. Maynard.—p. 599.

Heat Processing and Milk Proteins. The hypothesis that the reaction between reducing sugars and proteins may be responsible for a decreased nutritive value of heated proteins has seemed plausible. With this in mind, the possibility that such a reaction may occur in processed milk was investigated to determine the amount of damage, if any incurred during commercial heat processing, and to consider other factors which might influence the nutritive value of the milk proteins, such as the storage of frozen raw milk. Samples of raw, evaporated, and powdered milk were prepared from the same raw milk supply and were fed under described experimental conditions to four adult dogs to determine the digestibility and the biologic value of the processed milk. The nutritive value of the milk proteins was not decreased by processing. Diversity of observations between this and other experiments would seem to arise from variation both in the intensity and duration of heating. Five months' frozen storage did not change the nutritive value of the whole raw milk.

Effect of Emulsifiers. Experiments with rats described in this paper demonstrated that feeding any one of three emulsifiers at levels of 5 or 15 per cent of a basal soybean meal diet did not result in diarrhea or growth retardation, although these effects were manifested when an emulsifier, exemplified by Tween 60, was added to a basal casein diet. The authors postulate that the development of diarrhea under some conditions is due primarily to lack of residues in the basal diet to absorb the surface-active agent, which can be irritating to the intestinal tract by virtue of its physical properties. The study was conducted because non-ionic emulsifers are now used to technical advantage in the processing of widely used common foods, and their effects should be known.

Humidity and Vitamin Deficiencies. The growth of weanling rats fed a complete diet or diets deficient in vitamin A, riboflavin, or pantothenic acid was not found to be affected by extremely low or high humidity. However, animals deficient in pyridoxine grew more rapidly at a relative humidity of 90 per cent. The water consumption of rats receiving the complete diet and diets deficient in pyridoxine and pantothenic acid was greatest at low relative humidity. At 5 to 10 per cent relative humidity, a scaly dermatosis occurred within twelve days on the paws of both control and experimental rats. The animals fed the complete diet spontaneously recovered, while those which remained vitamin-deficient did not. The addition

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of iodinated casein to the complete diet decreased the extent of dermatosis. At 30 per cent relative humidity, dermatosis occurred only on the paws of the vitamin-deficient animals. At and above a relative humidity of 50 per cent, dermatosis was not observed in these rats. At 90 per cent relative humidity, a red pigment occurred extensively on the fur of the heads of animals fed diets deficient in pyridoxine, riboflavin, and pantothenic acid. This condition did not exist at 50 per cent relative humidity or below.

Thyroid Activity and Lipogenesis. Hypothyroidism has been shown to result in animal carcasses high in fat. The objective of a further investigation of this observation was to study the influence of hyperthyroidism, hypothyroidism, and the level of dietary fat on lipid biosynthesis in six groups of rats. Induced hyperthyroidism resulted in retarded growth, elevated body temperature, increased oxygen consumption, mild glycosuria, and reduced total lipid content of the body. In general, these effects were reversed in hypothyroidism. A high-fat diet tended to alleviate the effects of increased thyroid activity but enhanced the characteristics of depressed thyroid activity.

JOURNAL OF PEDIATRICS

Vol. 42, April, 1953

*Serum calcium and inorganic phosphate in the newborn infant, and their relation to different feedings. G. G. Graham, L A. Barness, and P. György.—p. 401.

Vol. 42, June, 1953

*Substitutes for cow's milk in infant feeding. J. Glaser.—p. 734.

Serum Calcium and Inorganic Phosphate in Newborn. This study confirms the many observations that the serum phosphate of newborn infants varies with the phosphate intake, but that normally high values are compensated for by the normal infant in a few days. This hyperphosphatemia, when it occurs, is not accompanied by a consistent hypocalcemia.

Cow's Milk Substitutes for Infants. At present, the best substitute for cow's milk is soybean milk. If soybean milk is unsatisfactory, a formula using strained meat as a protein base can be used. The homogenized meats may be prepared at home using a blender, or purchased commercially. Considerable and dramatic success has been experienced with atopic dermatitis, apparently due to sensitivity both to cow's milk and soybean milk, and also in treating severe gastrointestinal disturbances in early infancy due to sensitivity to cow's milk and sensitivity or intolerance to soybean milk. The meat "milk" is essentially a form of soup (just as soybean milk is essentially a bean soup) and has a chemical composition similar to that of cow's milk. The taste is pleasant and it is readily accepted by the infants. Stools are similar in frequency and appearance to those obtained when a cow's milk formula is used. Experiments are under way using whale meat, now readily available in the American market, as the protein base for meat milks. No members of this family are widely used for food in this country; thus congenital sensitivity to whale meat is not to be expected. A formula for a cow's milk substitute is included.

PSYCHOSOMATIC MEDICINE

Vol. 15, March–April, 1953

*Studies of the personality of patients suffering from urticaria. E. D. Wittkower.—p. 116.

Personality of Urticaria Patients. Personality studies were conducted on thirty-five sufferers from urticaria. Two-thirds of these stated that they missed parental affection as children, although this belief was not justified in a majority of instances. As children, the patients reacted in either an aggressive or a submissive manner and this behavior pattern carried over into their adult lives. Events entailing anticipated or actual withdrawals of love preceded the onset and relapses of urticaria. Thus it seems that the immunobiologic approach does not provide the only answer to the question of etiology of this and allied disorders. Psychopathologic mechanisms found to be operative in urticaria are: repressed aggressiveness, masochism, repressed exhibitionism, and regressive revival of infantile skin erotism.

PUBLIC HEALTH REPORTS

Vol. 68, May, 1953

*Climate and endemic dental fluorosis. D. J. Galagan and G. G. Lamson, Jr.—p. 497.

*Anchorage food study. E. M. Scott and E. S. Weiss.—p. 541.

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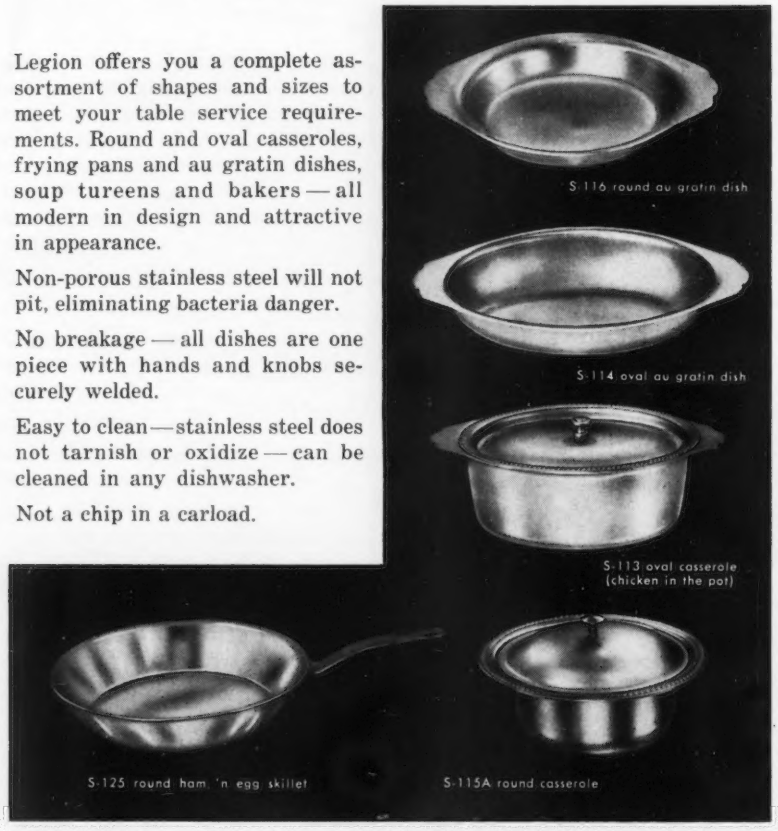
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Climate and Dental Fluorosis. Objectionable dental fluorosis was found to occur with about twice the intensity in hot Arizona areas as in midwestern communities with comparable fluoride concentrations in the water. The fact that an increased requirement for drinking water in hot climates results in increased ingestion of fluoride probably accounts for the findings. It is suggested that less than 1.0 p.p.m. fluoride may represent the optimal level for dental caries control in southern sections.

Anchorage Food Study. Civilian food consumption in Anchorage, Alaska, was determined in a census of food imported by rail, by truck, and by airplane, and by an estimate of local production in 1950. The amount of food stored was also studied to provide an estimate of the average period of storage and the time food stores would last if supplies were cut off. In comparing Alaskan food habits with those of continental United States, it was found that Anchorage residents eat well, the consumption of meat being high, with that of milk, milk products, and eggs satisfactory. Use of butter and margarine equals that of the States, as does the consumption of most fruits or vegetables. The study indicates that in the event of complete stoppage of normal supplies to Alaska, there would probably be enough staple foods to last until measures could be devised to meet the emergency. Many perishable items would become unavailable almost immediately, however, necessitating some substitutions.

SCIENCE

Vol. 117, May 1, 1953

*Concerning the site of nitrogen absorption in rats fed autoclaved or raw soybean oil meal. R. Borchers.—p. 482.

Vol. 117, May 8, 1953

*Decreased activity and energy balance in the hereditary obesity-diabetes syndrome of mice. J. Mayer.—p. 504.

Utilization of Soybean Rations. Some investigators have found the nitrogen absorption of rats fed raw soybean oil meal to be much lower than that of rats fed autoclaved soybeans, thus presenting a possible explanation of the lower nutritive value of raw soybeans. To retest the theory, rats were fed autoclaved and raw soybean rations containing 2.1 per cent total nitrogen for four days before being sacrificed and studied. In this experiment, the digestibility of raw soybean nitrogen and that of autoclaved soybeans appeared to show no significant difference.

Influence of Activity on Obesity. Obese animals are visibly less active than nonobese litter mates and it was the purpose of this study to quantitate this difference between 12 four-month-old nonobese mice, their 12 obese litter mates, and 12 young (two months) obese mice. The imbalance between energy intake and output was evaluated. It was found that the decrease in activity preceded marked obesity and did not result from it. Weight differences in the animals were accounted for almost entirely by fat. Paired feeding of obese and nonobese mice, which represented a curtailment of intake of about 25 per cent for the obese, was found to bring about an increased rate of activity for these animals and to stabilize their weight at the level reached before paired feeding was begun.

THE TOHOKU JOURNAL OF EXPERIMENTAL MEDICINE

Vol. 57, February 25, 1953

*Electrophoretic analysis of serum protein of children with or without nutritional dystrophy. Studies on the nutrition of children in the Hirosaki area. (14th report) H. Yoshida.—p. 205.

Effects of Nutritional Dystrophy. Reports are presented on the electrophoretic patterns of sera from children in the Hirosaki area, Japan. Total protein of the sera was estimated refractometrically. Tables show the findings in a group of "normal" children, in a group of children who were apparently healthy but who showed clinical manifestation of nutritional dystrophy to some extent, and in a third group of sick children who showed distinct symptoms of the condition. The third group displayed abnormality in the electrophoretic pattern, characterized by a decrease in albumin accompanied by an increase in alpha and gamma globulin.

FOOD ENGINEERING

Vol. 25, May, 1953

*Freezes to level off production. H. Tyor.—p. 64.
*"Year 'round on-pecans" by refrigerated storage. J. G. Woodroof and E. K. Heaton.—p. 83.
In-can baking perfected. D. N. League.—p. 86.
*How good is frozen OJ? M. D. Zinn and R. R. Bien.—p. 127.
Quick freezes and cartons shrimp at sea. C. E. Wright.—p. 133.

Frozen Storage of Baked Goods. Bakeries are achieving better uniformity of their products and a leveling off of peaks in production by freezing overproduction of bakery goods. Production can also be planned far ahead of receipt of orders to take care of peak periods. With a more uniform work schedule, employees enjoy an improved morale. Freezing products at −10°F. and holding at 10°F. has been found to be best. For a combination of freezing and holding, 10°F. proved bes'.

Refrigerated Storage of Nuts. It has been found that keeping delicately flavored nuts at 32°F. and 68 per cent relative humidity retains quality and checks insect damage. Nuts must be properly packaged and care taken to prevent absorption of outside flavors and odors.

Frozen vs. Fresh Orange Juice. How frozen concentrated orange juice compares with fresh juice in cost, taste preference, vitamin content, and other important factors has been determined by a two-year study in New York. Findings were: (a) In New York City, frozen orange juice costs a half to a third as much as fresh from Florida and California fruit. (b) Sugar-acid ratio is uniform for concentrate, but not for fresh

For your food file — interesting facts on canned mushrooms

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Nutrient	Quantity of Nutrient Per Serving	Approximate Percentage of Recommended Daily Allowance*	Approximate Percentage Minimum Daily Requirement**
Carbohydrate (available) (1)	1.4 gm	—	—
Fat (1)	0.12 gm	—	—
Protein (1)	2.6 gm	4	—
Caloric Value (1)	17 calories	1	—
Calcium (1)	5.4 mg	1	1
Phosphorus (1)	61 mg	—	8
Iron (1)	0.45 mg	4	5
Vitamin A (3)	15 I.U.	0	0
Thiamine (3)	0.014 mg	1	1
Riboflavin (2)	0.18 mg	10	9
Niacin (2)	1.5 mg	10	—
Vitamin C (3)	2$\frac{1}{2}$ mg	2	7

*Percentage based on Recommended Daily Allowance for physically active man—National Research Council. **Percentage based on Minimum Daily Requirement for adult over 12 years of age—Food and Drug Administration.

1. Food Research 11,391 (1946) 2. J. Am. Dietet. Assoc. 21,357 (1945)
3. J. Am. Dietet. Assoc. 23,226 (1947)

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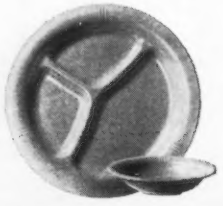

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juice. (c) Ascorbic acid in fresh juice and concentrates varies widely with seasons. (d) Peel oil is low in concentrate, but is affected in fresh juice by the method of squeezing. (e) A taste panel preferred fresh juices, both as to character and strength of flavor.

HOSPITAL MANAGEMENT

Vol. 75, May, 1953

*What a dietary training program involves. L. Whitney.—p. 86.

Psychiatry Meets Nutrition. Psychiatric technicians serve and supervise meals at Stockton (California) State Hospital, although food is prepared by the dietary department. A dietary training program has been inaugurated for the hospital's eight hundred psychiatric technicians to acquaint them with basic principles of nutrition and therapeutic attitudes toward food. The course—composed of lectures, demonstrations, on-the-job training, and supervision—is aimed primarily at developing the concept of food as important in physical and emotional rehabilitation. The program helps correlate food service activities on the ward with kitchen preparation, contributing to the acceptability of the food service. Each class, in addition to learning general nutrition, is shown by demonstration a new supplementary feeding formula. At Stockton State Hospital, importance is placed on proper service of food and the size of servings, as well as socialization among patients at meal-time. Films, pamphlets, and other visual aids are used, such as may be obtained from state departments of public health.

HOSPITALS

Vol. 27, June, 1953, Part I

*Unknown costs cost money. A. M. Macfarlane.—p. 97.

*How to make cost figures work. M. Whitmer.—p. 98.

*Ready-to-use meats: cost control aid.—p. 100.

Unknown Costs. Daily food cost reports, standardized recipes, production sheets, and so on, are not in themselves cost controls. They must be properly used if they are to function as checks and balances on the expenditure of money. The dietitian who fails to check the purchase order against the invoice, who neglects to see that her cooks follow the standardized recipes, is not taking proper action. The goal of cost controls should be wise expenditure for better patient meals, not greater hospital profits or mere cost reduction. Unknown costs, it is true, cause expenditure of money; however, excessive pressure on the control of known costs, due to inefficient management, may also be so detrimental as to ruin a hospital's public relations. In general, the problem of food cost control arises from a lack of attention to detail which in turn results in a lack of the action without which control cannot take place.

Putting Figures to Work. Before the dietitian can have a good cost accounting system, she must determine what she wants her figures to do. In general, a cost accounting system determines where the money has gone and shows which expenditures were necessary, desirable, and wise, thus serving as a guide for the future. In addition to food, the amounts spent for salaries and equipment are important factors in cost accounting.

Ready-to-Use Meats. Food cost control is threefold: quality control of raw materials, production control, and quantity or portion control of the finished product. Ready-to-use meats for the employee cafeteria are pointed out in a new booklet as meeting the standards of high quality as well as being a tool in food cost control. Their uniformly high quality remains consistent throughout cooking, and the average ready-to-use product may be relied on to provide as much protein as its equivalent primal cut of meat. Ready-to-use meats are without waste, require little preparation time, permit the dietitian to cater to native tastes, and may be used as "extenders" or replacements for higher-priced meats. The booklet features charts on the storage and composition of ready-to-use meats and gives information on the typical ingredients, usual seasonings, and processing steps of fourteen popular meats.

HOTEL MANAGEMENT

Vol. 63, May, 1953

*Food briefs. N. Greene.—p. 21.

More money from pork. P. F. Muellet.—p. 66.

*Coffee, tea, cocoa. P. P. Logan.—p. 77.

Food Briefs. All frozen food products have a limited "tolerance" to temperature fluctuations. By early mishandling, the tolerance can be lowered so that the product becomes quite sensitive to later adversity. . .Loss of flavor and the appearance of odors have been eliminated by 1-min. cathode-ray irradiation of meats, spinach, and tomatoes for commercial preservation. . .Harvested tomatoes ripen best at temperatures between 50° and 65°F.; therefore, shippers should use less ice than required for most fruits and vegetables.

Coffee, Tea, Cocoa. The coffee industry is reviewed from the initial step of planting the four commercial types of coffee trees; to preparing the berries for market by means of water-filled tanks where the mature berries sink and the dry, over-ripe, and green berries float; through curing, blending, and brewing. Powdered coffee is made by passing warm water through fine grains and evaporating this liquor into a heavy sirup which in turn is reduced to a powder on vacuum driers. Regardless of type of coffee-making equipment, 2½-gal. water should be used per pound of coffee. Coffee should never be boiled and should only be served fresh. . .Tea, which is growing in popularity, is traced through its processing, and the green and black grades are compared. . .The basis for all cocoa preparations is the cacao or cocoa bean. By fermentation, curing, and roasting, it is prepared for market. Cocoa powder is the result of processing cocoa liquor in a hydraulic press. This powder must be chemically treated before it becomes soluble in milk or water.

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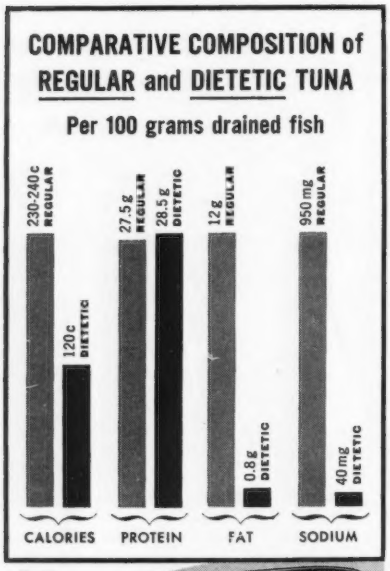

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THE HOTEL MONTHLY

Vol. 61, June, 1953

*Tempt the ladies right out of their kitchens.—p. 45.

Hot Weather Problems. Mrs. America, reader of consumer magazines with their appeal-tested food ideas, won't budge from her kitchen for stereotyped summer luncheons which hotels commonly offer. Air-conditioned comfort will not alone encourage women to entertain in hotels; catering men are urged to read and heed the food advertising in women's magazines. Recent trends show that lighter-type entrées are acceptable not only by women but also at businessmen's noon functions. The indispensability of variety and eye appeal in the hot-weather menu is stressed. Dessert innovations and changes in the type of dessert during the summer will stimulate orders when appetites—and, therefore, profits—lag. An artistic dish, one caterer notes, is just as easily prepared as an eyesore, particularly if colored illustrations are used as guides for the cooks.

INSTITUTIONS MAGAZINE

Vol. 32, June, 1953

*Equipped for production.—p. 10.

*How to organize sanitation seminars. W. H. Haskell.—p. 22.

Dirty dishes get attention of food group executives.—p. 41.

*How to prepare greens for salads.—p. 106.

*How to set up salad assembly lines.—p. 110.

*How to plan and equip your kitchen. J. R. Meyers.—p. 138.

Bacteriology for food handlers easily learned. E. Wright.—p. 148.

Production-Line Kitchen. Ten patients per minute are served at Sinai Hospital, Detroit, via a horizontal and vertical tray conveyor system. When requisitioned from storage or refrigeration areas, food proceeds without cross-traffic to the preparation section, the main cooking area, and the heated food compartments beside the conveyor. Preparation in the cold foods departments, the diet kitchen, and the kosher meat and milk kitchens may occur simultaneously without interference. The route of a tray from setting-up to patient is described. At serving time, maids from the several floors are concentrated on the particular floor being served, so that they can carry the trays directly from the conveyor to the rooms. Illustrations and a floor plan are shown.

Sanitation Seminars. Convention-type programs, erroneously called "seminars," have several weaknesses when sanitation is the theme. These include: generalization to a point where some individuals hear nothing to their interest, insufficient time for presentation of topics, and time wasted on welcoming and introductory speeches. Panel meetings also have a defect: the panels too often occupy relatively little time, and questions, scattered across the broad field of sanitation, can receive but limited replies. Two main factors should be remembered: seminars are educational meetings, *not* conventions; and arrangements should provide the utmost in education. The author suggests features for a successful seminar.

Glamor in Greens. Greens, the first step in preparing and serving salads, deserve the best of handling. Rules for the preparation of "cut" greens and for general care of greens are given. The preparation of ever-popular lettuce is outlined in detail with illustrations. Varieties of greens suitable for salads are listed.

Salad Assembly Lines. The salad set-up in a Toronto restaurant is discussed and illustrated. Rules for procedure, using either one worker or two, are listed. Speed is essential in salad work, it is emphasized, but not at the expense of quality.

Kitchen Planning and Equipment. Three goals are dwelt on in a series of which this article is the first: (a) to speed food service by eliminating cross-traffic and personnel bottlenecks, also reducing cook-waitress clashes; (b) to speed kitchen production by organizing employees and their tools for departmentalized efficiency; and (c) to reduce over-all personnel needs by mechanizing operations and introducing labor-saving equipment. Flow charts show the seven basic departments of a kitchen (storage, vegetable preparation, short-order or diet kitchen, cooking, baking, serving, and dishwashing) and the movement of food, dishes, and service in an industrial cafeteria. Reasons for placement of different departments within the kitchen are given; e.g., the dishwashing and serving departments are the two that waitresses most often use and should, therefore, be as close as possible to the dining room doors. Good tools, the author points out, result not only in direct financial benefits, but improved products and morale, minimum spoilage, and greater customer satisfaction.

THE MODERN HOSPITAL

Vol. 80, June, 1953

*Centralized or decentralized service? M-C. Rowbotham.—p. 114.

*How to allocate food storage space. J. S. Pirkey.—p. 116.

Combination Food Service. Centralized and decentralized food service are combined and modified at Faulkner Hospital, Boston, for greater efficiency and patient satisfaction. The selective menu is used for all patients. "House-diet" plates are prepared in the main kitchen; therapeutic meals are served in a special kitchen; and each tray is individually checked by a dietitian. Food travels from the range directly to plates which are placed immediately in a hot-food truck. Each floor has its own ward kitchen and its own hot and cold food trucks. In the ward kitchens, trays are "set up" by diet maids, food is assembled by a nurse, and a hospital aide takes the tray to the patient. This new method of service has reduced serving time approximately one-third.

Food Storage Space. Preplanning is needed to determine food storage space allotment accurately. Factors should be considered, such as: (a) bed capacity; (b) peak load of employees' and ambulatory patients' meals; (c) average three-meal-day count for a

BOSTON'S BETH ISRAEL HOSPITAL

COOKS WITH GAS

THE DEPENDABLE, MODERN WAY OF PREPARING FOOD IN QUANTITY

Administrator: Dr. Charles Wilinsky
Director of Dietetics: Mrs. Lillian M. Reiner
Architects: Curtin & Riley, Boston
Kitchen Engineers: John McDonald Co., Boston
Kitchen Equipment: Morandi-Protor Co., Inc.

An investment of a third of a million dollars in a hospital kitchen is not made without careful study. At Beth Israel Hospital, in Boston's Medical Center, a planning staff consisting of the dietitian, hospital administrator, and kitchen engineer worked with the architects to select equipment and the operating pattern.

A vast array of Gas Cooking and Baking Equipment serves the patients in this 365-bed hospital, where every effort is made to provide food which will aid in effective therapy despite diet prescribed. The stainless-steel and monel-metal Gas Equipment in Beth Israel Hospital includes—

11 Vulcan hot top ranges
5 Vulcan salamander broilers
3 Vulcan heavy duty broilers
2 Vulcan fry-top ranges
1 Blodgett baking oven
2 Blodgett roasting ovens
1 Century revolving oven
1 Market forge steamer
2 Vulcan deep-fat fryers

More than 70,000 meals are served each month at Beth Israel Hospital, one-third of them being special-diet meals. The main kitchen is equipped for preparing food according to strict dietary laws, as well as for other types of medically prescribed diets. Decentralized service to patients is provided through well equipped floor kitchens.

During 23 years at Beth Israel, Chef Bill Janek has always cooked with GAS, and his experience with Gas Cooking and Baking Equipment has paralleled that of thousands of other hospital chefs—Gas Cooking is always the dependable, clean, and modern way of preparing food in quantity.

You can get ample proof of savings by calling your Food Service Equipment Dealer and your Gas Company Representative.

MORE AND MORE... THE TREND IS TO GAS FOR COMMERCIAL COOKING

AMERICAN GAS ASSOCIATION 420 LEXINGTON AVENUE • NEW YORK 17, NEW YORK

month; (d) normal stocks of perishables and staple supplies; (e) food allowances, by food groups, in pounds of "as purchased" food per person per day; and (f) commissary and kitchen food storage space requirements. A sample table of various storage space requirements is shown. Geographic location, type of menu, and type of institution influence the requirements for refrigeration and storeroom space so greatly that the use of a dollars-and-cents volume, or a formula related to the dollars-and-cents volume of the amount of food purchased is no criterion of the quantity and kind of space required.

PERSONNEL JOURNAL

Vol. 32, May, 1953

*Advantages of forced leadership training. E. E. Jennings.—p. 7.

*Older workers' efficiency in jobs of various types. M. W. Smith.—p. 19.

"Forced" Leadership Training. Maximum participation is the aim of forced leadership training, in which a situation is developed that will tend to "force" people to assume leadership. Foremen are divided into small groups to solve a human relations problem. Those who assume leadership in their groups are separated from the rest, who in turn are "split up" into different groups to study another problem. This procedure is continued until only two or three nonleaders remain. Many foremen feel that lack of strict control implies weakness and need to experience democratic leadership before they will accept it. Forced leadership shows them that their effectiveness actually increases when they share the solving of problems with those they are expected to lead. This sharing of responsibility develops teamwork, is conducive to cooperative problem-solving, and separates foremen with superior ability and skill from those without these characteristics.

Older Workers. Men from eighteen to seventy-six years old employed by one large concern were studied to determine the relation of age to industrial efficiency. Employees were divided into skilled, unskilled, and clerical groups. The findings, given in tabular form, show that few traits seemed to change with age, and fewer still changed consistently with age for all three groups. Speed and learning ability seemed to decline with age; however, an increase was noted in steadiness, and the ability to work unsupervised rose somewhat. No more older men received negative evaluations indicating low total worth than young men. Suggestions for use of mature workers include selective retirement, retraining, transferring to other positions, and adjustment of jobs to suit the workers.

PRACTICAL HOME ECONOMICS

Vol. 31, June, 1953

*Teen-age diets are inadequate. J. de Goumois.—p. 31.

Malnourished Teen-Agers. Poor diet is alarmingly common among adolescents of all socioeconomic levels, according to a recent mass study in Pennsylvania of teen-age food habits. Underweight is a more serious problem for this age group than overweight; less than 30 per cent of the boys and girls studied met the recommended allowance for total calories. Boys' diets were higher than girls' in most nutrients. The subjects received detailed physical examinations to determine the effects of nutritional deficiencies. Many showed poor growth records; other defects included poor teeth, eye difficulties, nervous habits, and nutritional anemia. Teen-styled nutrition education is urged.

WHAT'S NEW IN HOME ECONOMICS

Vol. 17, June, 1953

*The home demonstration agent and her job. M. Hogan.—p. 42.

*Milk and its products in family and party desserts —p. 54.

Afterglow from the National Food and Nutrition Institute.—p. 56.

Extension Work. Higher salaries, more generous retirement provisions, improved working conditions, and increased public recognition have added much in recent years to the satisfactions of the work of the home demonstration agent. The modern county extension offices in Durham, North Carolina, are contrasted with the ill-equipped cubicle which served as the author's first office two decades ago. Great progress has been made generally throughout the Extension Service in bringing the county agricultural agent and the home demonstration agent together in the same building, providing private offices for each extension worker, equipping offices more completely, and providing efficient secretarial help.

Dairy Desserts. Desserts using milk or milk products aid in increasing milk consumption by people of all ages. Being bland, milk combines well with both mild- and strong-flavored foods; because it is slightly sweet, only a little sugar need be added when making many milk desserts. The advantages of evaporated milk and nonfat dry milk solids are discussed. There are many desserts, such as puddings, where milk is the main ingredient; these require some thickening agent to give a suitable consistency. The individual properties of thickening agents are described. Other desserts, e.g., cakes, utilize milk but not as the principal ingredient. Cream in desserts, cheese in and for desserts, and dairy products in frozen desserts are discussed

Quantity Iced Tea Formula

In 1948, a survey indicated that people consumed twice as much iced tea in their homes as when they drank in restaurants. The reason given was that restaurant iced tea was too weak. To stimulate restaurant sales, the Tea Association of the USA, therefore, developed a formula for bulk production of proper-strength iced tea. Now known as the "2-oz. formula" and approved by the National Restaurant Association, it is given below:

2-Oz. Formula for Iced Tea

1. Pour 1 gal. boiling water over a 2-oz. tea bag or 2 1-oz. tea bags in a crock or stainless steel container.
2. Let steep 6 to 10 min.—no longer. Remove tea bags. Serve in ice-filled glasses.

Concentrate Method for Larger Volume Preparation

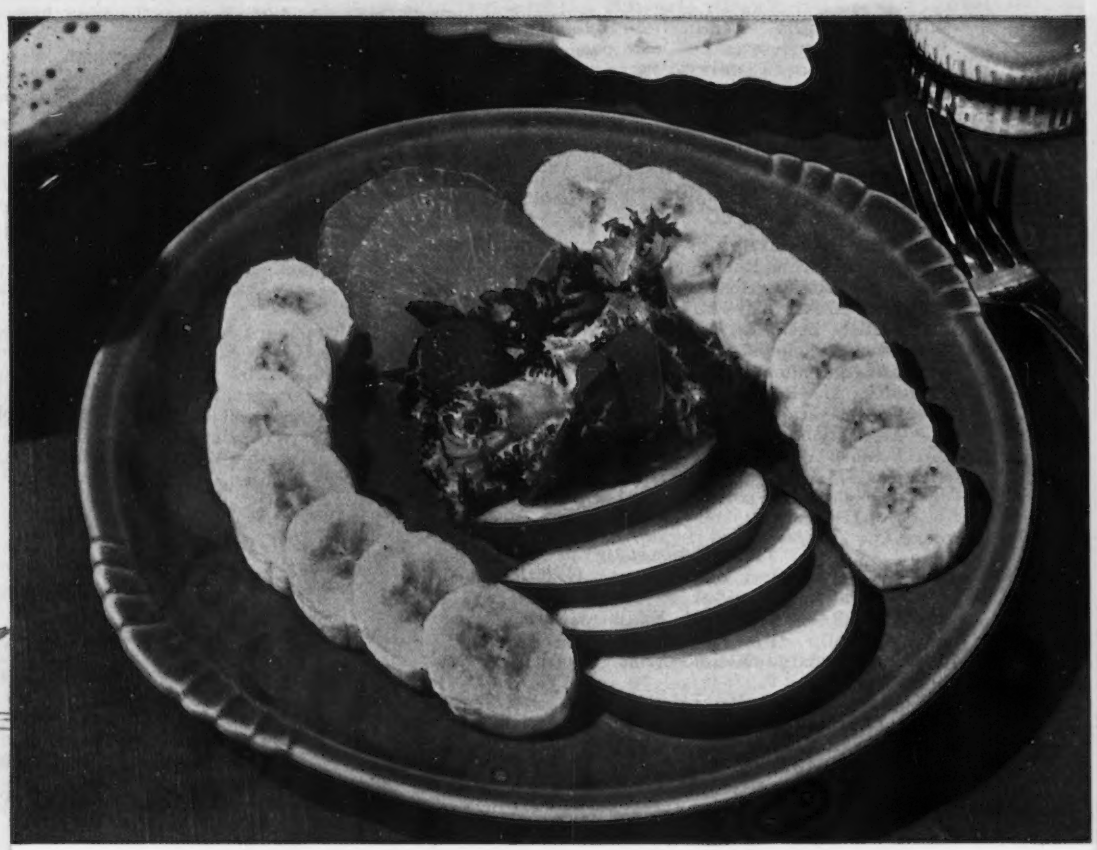
1. Pour 3 pt. boiling water over 4 1-oz. tea bags in a crock or stainless steel container of such diameter to cover bags with boiling water.
2. Let steep 6 to 10 min., stir and remove bags, pressing them against the side of the container to squeeze out the liquid.
3. Add the concentrate fluid to 7 qt. cold water (do not add water to the concentrate or tea may cloud), and you have 8 qt. tea ready to serve in ice-filled glasses.
4. Keep reserve batch of concentrate in the steam table or oven (at around 130° to 150°) until dilution time. This will prevent clouding. Do not keep any batch longer than 6 hr.

By adopting this formula, restaurants from all parts of the country have reported that their sales in summer have jumped anywhere from 50 to 400 per cent on this profitable item. At 10 cents a glass, the 2-oz. formula results in a 22 per cent food cost, including the cost of tea, lemons, sugar, and ice for 20 servings.—*From News Bulletin of the National Restaurant Association 34: 16 (June–July), 1953.*

CHIQUITA BANANA SAYS:

Serve as a salad or dessert...

Banana Fruit Plate



fully ripe
anana...
llow peel
ecked with brown.

hree
op
anking
uits combine
or taste appeal
nd good nutrition.

Lots of
appetite
appeal too!

BANANA FRUIT PLATE

1 orange, peeled
1 sweet red apple, unpeeled
2 or 3 berries or cherries
1 ripe banana*
Crisp salad greens

Use fully ripe banana...yellow peel flecked with brown

Cut orange crosswise into slices, then each slice into halves. Wash apple and cut into wedges. Peel and slice banana. Arrange apple wedges, orange and banana slices as shown in photograph. Garnish. Serve with sweet or tart dressing.

Makes 1 large or 2 small servings.

HOME ECONOMICS DEPARTMENT
UNITED FRUIT COMPANY, Pier 3, North River, New York 6, N. Y.

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and dinners
...year 'round!

There are vitamins and minerals
In whatever kind you buy-aye,
They not only are nutritious-
but they also taste delicious.

PROGRAM, THIRTY-SIXTH ANNUAL MEETING, THE AMERICAN DIETETIC ASSOCIATION

SHRINE AUDITORIUM AND CONVENTION HALL, LOS ANGELES, CALIFORNIA

AUGUST 25–28, 1953

All meetings, unless otherwise specified, will be held at the Shrine Auditorium

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9:00 a.m.—REGISTRATION AND EXHIBITS, Shrine Convention Hall

10:30 a.m.—OPENING SESSION—Beulah Hunzicker, *Presiding*

Invocation—Rt. Rev. Msgr. Thomas J. O'Dwyer, Director of Health and Hospitals, Archdiocese of Los Angeles

Greetings—Wilton L. Halverson, M.D., Dr. P.H., President, American Public Health Association

Greetings—Ritz Heerman, President-Elect, American Hospital Association

Freedom Is Never Free—Robert R. Gros, Advertising Manager, Pacific Gas and Electric Company, San Francisco

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Food Service Management in a Small Hospital Administrative Dietitian in Large Food Service Mass Feeding

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The Future of Your Staff—L. O. Stockford, Industrial Relations Adviser, Lockheed Aircraft Corporation, Burbank, California

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Not Good if Detached—Elmore Petersen, Ll.D., University of Colorado School of Business, Boulder

Together We Work—Carlos A. Efferson, Consultant, Kaiser Aluminum and Chemical Corp., Oakland

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THEME: Guideposts to the Future—Fern Gleiser, *Moderating*

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Virginia Toews, University of Kansas Medical Center, Kansas City

Marjorie White, Iowa State College, Ames

Virginia E. Wood, Franklin Hospital, San Francisco

10:00 a.m.—STEPS TOWARD BETTER WORLD NUTRITION

Bilateral Health Programs in Latin America—Wilton L. Halverson, M.D., Dr. P.H., Director, State Department of Public Health, San Francisco, and President, American Public Health Association

Teaching Nutrition in the Melting Pot of the Pacific—Marjorie G. Abel, Chief, Bureau of Nutrition, Department of Health, Honolulu, Hawaii

Child Feeding in Peru—Ruth L. Huenemann, School of Public Health, University of California, Berkeley
Food Patterns of the Marshallese and Trukese of the Trust Territory of the Pacific Islands—Mary Murai, Department of Foods and Nutrition, University of Hawaii, Honolulu

10:00 a.m.—ON YOUR TOES!
Plan on Easier Work—John G. Carlson, Lecturer, School of Business Administration, University of California, Los Angeles
Be Right, Before You Buy Equipment—Clarice D. Gullickson, Chief, Administration Section, Dietetic Division, Veterans Administration, Washington
Imagination Unlimited—Fred Schmid, Fred Schmid Associates, Los Angeles

1:00 p.m.—CONFERENCES AND DISCUSSION PERIODS (repeated Tuesday through Friday, limited to 75 persons each)—see Tuesday listing

1:00 p.m.—THE AUXILIARY WORKER
A.D.A. Studies the Auxiliary Worker—Isola D. Robinson, American Hospital Association, Chicago
Various Approaches—reported by members
Margaret Dykes, Dietary Consultant, Georgia Dept. of Public Health, Atlanta
Louise C. Poley, Director of Dietetics, Denver Dept. of Health and Hospitals
Elizabeth Perry, Chief Dietitian and Assistant Superintendent, City Hospital, Cleveland
Committee on Institutional Feeding of the Food and Nutrition Board—Margaret A. Ohlson, Ph.D., Michigan State College, East Lansing
Discussion period

2:00 p.m.—TWO-WAY COMMUNICATIONS
Do You Have Speak-ability?—Gerald E. Marsh, Ph.D., Chairman, Department of Speech, University of California, Berkeley
Have You Tried Listening?—Donald E. Bird, Ph.D., Communications Division, Stephens College, Columbia, Missouri

2:00 p.m.—NEWER FINDINGS IN DIET THERAPY
Intake of Excess Fat and Calories in Relation to the Development of Human Atherosclerosis—John W. Gofman, M.D., Donner Laboratory, University of California, Berkeley
Comparative Effects of Diets Containing Large Amounts of Animal and Vegetable Fat Respectively, Upon Serum Lipids in Normal and Abnormal Human Subjects—Laurance W. Kinsell, M.D., Director, Institute for Metabolic Research, Highland Alameda County Hospital, Oakland
National Research Council Studies Low Sodium—James R. Wilson, Secretary, Council on Foods and Nutrition, American Medical Association, Chicago

3:30 p.m.—FOOD TECHNOLOGY
Newer Developments in Food Processing—Emil Marcel Mrak, Ph.D., Chairman, Department of Food Technology, University of California, Davis
Effect of Heat on Protein and Other Nutrients—Agnes Fay Morgan, Ph.D., Head, Department of Home Economics, University of California, Berkeley
Recent Developments in Precooked Frozen Foods—Helen L. Hanson, Ph.D., Poultry Products Division, Western Regional Research Laboratory, U. S. Department of Agriculture, Albany, California

3:30 p.m.—GUIDELINES FOR EFFECTIVE EDUCATIONAL MATERIALS
When You Write—William F. Calkins, Agricultural Publications, University of California, Berkeley
When You Use Visual Aids—Jerome Grossman, Associate in Public Health, University of California, Berkeley

7:00 p.m.—EXHIBITORS' DINNER, Biltmore Hotel

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9:00 a.m.—REGISTRATION AND EXHIBITS, Shrine Convention Hall

10:00 a.m.—PEDIATRICS
Nutritional Requirements of Infants—Genevieve Stearns, Ph.D., Department of Pediatrics, University Hospitals, Iowa City
Emotional Factors in Child Feeding—John Adolph Anderson, M.D., Ph.D., Head, Dept. Stanford University Medical School, San Francisco
Feeding the Preschool Child—Muriel Ginsberg, Nutritionist, Merrill-Palmer School, Detroit

10:00 a.m.—COST CONTROL
Finding and Eliminating Hidden Operation Costs—Helen S. Dionne, Assistant Manager, Commissary, The Prudential Insurance Company, Los Angeles
Control through Cost Planning—Margaret E. Terrell, University of Washington, Seattle
How Systematic Cost Control Succeeds—Eve W. Straight, Restaurant Division Manager, The H. C. Capwell Company, Oakland

12:00 noon—HISTORY OF NUTRITION AND DIETETICS LUNCHEON, University of Southern California Campus—E. Neige Todhunter, *Presiding*
The Conquest of Scurvy—A. J. Lorenz, Director, Nutrition Research, Sunkist Growers, Los Angeles

1:00 p.m.—CONFERENCES AND DISCUSSION PERIODS (repeated Tuesday through Friday, limited to 75 persons each)—see Tuesday listing

1:00 p.m.—COOPERATIVE APPROACH AIDS MEDICAL THERAPY—Gertrude Miller, *Presiding* and *Moderating*
Participants:
Physician: James Halsted, M.D., Gastroenterology Section, Veterans Administration, Los Angeles
Nurse: Jeanne Tague, Clinical Instructor, Medical Nursing, Veterans Administration, Los Angeles
Medical Social Worker: Jeanette Popkin, Dept. of Social Service, Veterans Administration, Los Angeles
Dietitian: Elva A. Hiscock, Chief of Clinics and Diet Therapy, General Medical and Surgical Hospital, Veterans Administration, Los Angeles

2:15 p.m.—HISTORY OF NUTRITION AND DIETETICS
Child Feeding in the United States in the 19th Century—Lydia J. Roberts Essay Award Recipient
Claude Bernard and Glycogenesis—J. M. D. Olmsted, Ph.D., D.Sc., Chairman, Department of Physiology, University of California, Berkeley

2:00 p.m.—CHALLENGES TO YOU
Dietetics and Nutritional Science—Wendell H. Griffith, Ph.D., Chairman, Department of Physiological Chemistry, School of Medicine, University of California Medical Center, Los Angeles
Your Role—Katherine Mitchell Johnson, Vancouver, Washington
Teamwork—Anthony Rourke, M.D., Hospital Council of Greater New York City

2:00 p.m.—MENTAL HEALTH
Recent Advances in Psychiatric Research—Douglas Campbell, M.D., School of Medicine, University of California, San Francisco
Food Management of Mentally Ill Patients—Verdi Miller, Area Dietetic Representative, Veterans Administration, San Francisco
Role of the Dietitian in the Mental Hospital—E. H. Crawfis, M.D., Medical Deputy Director, Department of Mental Hygiene, Sacramento

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Bilateral Health Programs in Latin America—Wilton L. Halverson, M.D., Dr. P.H., Director, State Department of Public Health, San Francisco, and President, American Public Health Association

Teaching Nutrition in the Melting Pot of the Pacific—Marjorie G. Abel, Chief, Bureau of Nutrition, Department of Health, Honolulu, Hawaii

Child Feeding in Peru—Ruth L. Huenemann, School of Public Health, University of California, Berkeley
Food Patterns of the Marshallese and Trukese of the Trust Territory of the Pacific Islands—Mary Murai, Department of Foods and Nutrition, University of Hawaii, Honolulu

10:00 a.m.—ON YOUR TOES!
Plan on Easier Work—John G. Carlson, Lecturer, School of Business Administration, University of California, Los Angeles
Be Right, Before You Buy Equipment—Clarice D. Gullickson, Chief, Administration Section, Dietetic Division, Veterans Administration, Washington
Imagination Unlimited—Fred Schmid, Fred Schmid Associates, Los Angeles

1:00 p.m.—CONFERENCES AND DISCUSSION PERIODS (repeated Tuesday through Friday, limited to 75 persons each)—see Tuesday listing

1:00 p.m.—THE AUXILIARY WORKER
A.D.A. Studies the Auxiliary Worker—Isola D. Robinson, American Hospital Association, Chicago
Various Approaches—reported by members
Margaret Dykes, Dietary Consultant, Georgia Dept. of Public Health, Atlanta
Louise C. Poley, Director of Dietetics, Denver Dept. of Health and Hospitals
Elizabeth Perry, Chief Dietitian and Assistant Superintendent, City Hospital, Cleveland
Committee on Institutional Feeding of the Food and Nutrition Board—Margaret A. Ohlson, Ph.D., Michigan State College, East Lansing
Discussion period

2:00 p.m.—TWO-WAY COMMUNICATIONS
Do You Have Speak-ability?—Gerald E. Marsh, Ph.D., Chairman, Department of Speech, University of California, Berkeley
Have You Tried Listening?—Donald E. Bird, Ph.D., Communications Division, Stephens College, Columbia, Missouri

2:00 p.m.—NEWER FINDINGS IN DIET THERAPY
Intake of Excess Fat and Calories in Relation to the Development of Human Atherosclerosis—John W. Gofman, M.D., Donner Laboratory, University of California, Berkeley
Comparative Effects of Diets Containing Large Amounts of Animal and Vegetable Fat Respectively, Upon Serum Lipids in Normal and Abnormal Human Subjects—Laurance W. Kinsell, M.D., Director, Institute for Metabolic Research, Highland Alameda County Hospital, Oakland
National Research Council Studies Low Sodium—James R. Wilson, Secretary, Council on Foods and Nutrition, American Medical Association, Chicago

3:30 p.m.—FOOD TECHNOLOGY
Newer Developments in Food Processing—Emil Marcel Mrak, Ph.D., Chairman, Department of Food Technology, University of California, Davis
Effect of Heat on Protein and Other Nutrients—Agnes Fay Morgan, Ph.D., Head, Department of Home Economics, University of California, Berkeley
Recent Developments in Precooked Frozen Foods—Helen L. Hanson, Ph.D., Poultry Products Division, Western Regional Research Laboratory, U. S. Department of Agriculture, Albany, California

3:30 p.m.—GUIDELINES FOR EFFECTIVE EDUCATIONAL MATERIALS
When You Write—William F. Calkins, Agricultural Publications, University of California, Berkeley
When You Use Visual Aids—Jerome Grossman, Associate in Public Health, University of California, Berkeley

7:00 p.m.—EXHIBITORS' DINNER, Biltmore Hotel

Thursday, August 27

8:00 a.m.—REGISTRATION OF DELEGATES TO THE HOUSE OF DELEGATES, Hotel Statler

8:30 a.m.—MEETING OF THE HOUSE OF DELEGATES, Hotel Statler—Lucille M. Refshauge, *Presiding*

9:00 a.m.—REGISTRATION AND EXHIBITS, Shrine Convention Hall

10:00 a.m.—PEDIATRICS
Nutritional Requirements of Infants—Genevieve Stearns, Ph.D., Department of Pediatrics, University Hospitals, Iowa City
Emotional Factors in Child Feeding—John Adolph Anderson, M.D., Ph.D., Head, Dept. Stanford University Medical School, San Francisco
Feeding the Preschool Child—Muriel Ginsberg, Nutritionist, Merrill-Palmer School, Detroit

10:00 a.m.—COST CONTROL
Finding and Eliminating Hidden Operation Costs—Helen S. Dionne, Assistant Manager, Commissary, The Prudential Insurance Company, Los Angeles
Control through Cost Planning—Margaret E. Terrell, University of Washington, Seattle
How Systematic Cost Control Succeeds—Eve W. Straight, Restaurant Division Manager, The H. C. Capwell Company, Oakland

12:00 noon—HISTORY OF NUTRITION AND DIETETICS LUNCHEON, University of Southern California Campus—E. Neige Todhunter, *Presiding*
The Conquest of Scurvy—A. J. Lorenz, Director, Nutrition Research, Sunkist Growers, Los Angeles

1:00 p.m.—CONFERENCES AND DISCUSSION PERIODS (repeated Tuesday through Friday, limited to 75 persons each)—see Tuesday listing

1:00 p.m.—COOPERATIVE APPROACH AIDS MEDICAL THERAPY—Gertrude Miller, *Presiding* and *Moderating*
Participants:
Physician: James Halsted, M.D., Gastroenterology Section, Veterans Administration, Los Angeles
Nurse: Jeanne Tague, Clinical Instructor, Medical Nursing, Veterans Administration, Los Angeles
Medical Social Worker: Jeanette Popkin, Dept. of Social Service, Veterans Administration, Los Angeles
Dietitian: Elva A. Hiscock, Chief of Clinics and Diet Therapy, General Medical and Surgical Hospital, Veterans Administration, Los Angeles

2:15 p.m.—HISTORY OF NUTRITION AND DIETETICS
Child Feeding in the United States in the 19th Century—Lydia J. Roberts Essay Award Recipient
Claude Bernard and Glycogenesis—J. M. D. Olmsted, Ph.D., D.Sc., Chairman, Department of Physiology, University of California, Berkeley

2:00 p.m.—CHALLENGES TO YOU
Dietetics and Nutritional Science—Wendell H. Griffith, Ph.D., Chairman, Department of Physiological Chemistry, School of Medicine, University of California Medical Center, Los Angeles
Your Role—Katherine Mitchell Johnson, Vancouver, Washington
Teamwork—Anthony Rourke, M.D., Hospital Council of Greater New York City

2:00 p.m.—MENTAL HEALTH
Recent Advances in Psychiatric Research—Douglas Campbell, M.D., School of Medicine, University of California, San Francisco
Food Management of Mentally Ill Patients—Verdi Miller, Area Dietetic Representative, Veterans Administration, San Francisco
Role of the Dietitian in the Mental Hospital—E. H. Crawfis, M.D., Medical Deputy Director, Department of Mental Hygiene, Sacramento

3:30 p.m.—THE GROUP APPROACH TO WEIGHT REDUCTION
The Obesity Problem—H. I. Harvey, M.D., Director, Department of Research, Herrick Memorial Hospital, Berkeley
A Review of the Herrick Project—William D. Simmons, Administrator, Department of Research, Herrick Memorial Hospital, Berkeley
Psychological Aspects—Robert F. Suczek, Ph.D., Clinical Psychologist, Department of Research, Herrick Memorial Hospital, Berkeley
As the Nutritionist Sees It—Helen E. Walsh, Chief, Nutrition Service, California Department of Public Health, San Francisco

3:30 p.m.—FOOD SERVICE IN PERSPECTIVE
How We Fare with Bills of Fare—Ruth Gordon, Director, Department of Dietetics and Nutrition, University of Kansas Medical Center, Kansas City
Value of Dining Rooms for Hospital Patients—Doris Boyle Thompson, Dietetic Division, Veterans Administration, Washington, D. C.
Pros and Cons of Centralized Food Service—Ruth M. Kahn, Director of Dietetics, Michael Reese Hospital, Chicago
Decentralized Food Service—Ruth S. Dickie, Chief Dietitian, Wisconsin General Hospital, Madison

4:00 p.m.—MEETING THE GOALS OF THE MENTAL HOSPITAL FOOD PROGRAM—Lavern Owens, *Presiding and Moderating*
Corrective Dietary Management—Cora E. Kusner, Chief Dietitian, Colorado State Hospital, Pueblo
Special Techniques in Food Preparation and Service—Anna Marguerite Dunn, Chief Dietitian, Nebraska State Hospital, Lincoln
Training Food Service Employees—Josephine Hardison, Pacific Colony, Spadra, California

5:30 p.m.—EXHIBITS CLOSE

8:00 p.m.—NUTRITION RESEARCH—1953, Hotel Statler
Recent Research in Nutrition—Charles Glen King, Ph.D., Scientific Director, The Nutrition Foundation, Inc., New York City
Newer Concepts in the Treatment of the Diabetic—Samuel Soskin, M.D., Consultant in Medicine, Cedars of Lebanon Hospital, Los Angeles
Recommended Allowances in Therapeutic Nutrition—Wendell H. Griffith, Ph.D., Chairman, Department of Physiological Chemistry, University of California Medical Center, Los Angeles

Friday, August 28

(All Friday meetings to be at the Hotel Statler)

8:30 a.m.—MEETING OF STATE FOOD ADMINISTRATION CHAIRMEN—Cora E. Kusner, *Presiding*

8:30 a.m.—MEETING OF STATE PROFESSIONAL EDUCATION CHAIRMEN—Henderika J. Rynbergen, *Presiding*

9:00 a.m.—REGISTRATION, Hotel Statler

9:30 a.m.—REVISED RECOMMENDED DIETARY ALLOWANCES AND EXPERIMENTAL PROGRESS
Studies on the Factors Concerned in the Incidence of Dental Caries—Clara A. Storvick, Ph.D., Department of Food and Nutrition, School of Home Economics, Oregon State College, Corvallis
Relationship of Other Dietary Constituents to the Use of Food Cholesterol in the Animal Body—Ruth Okey, Ph.D., Professor of Home Economics and Biochemistry, University of California, Berkeley
Revisions of the Recommended Dietary Allowances—Robert E. Shank, M.D., School of Medicine, Washington University, St. Louis
Dietary Patterns of an Aging Group—Helen L. Gillum, Ph.D., Associate Professor, Dept. of Home Economics, University of California, Berkeley

9:30 a.m.—FOOD QUALITY SPEAKS
Quantity, Yes—But Quality, Too—Christine Ricker, Director, Dining Halls, Stanford University
Giving Food Sales Appeal—Emily Chase Leistner, Foods Consultant, Stockton, California
Flair and Flavor—Genevieve A. Callahan, Magazine Writer and Food Consultant, San Francisco

9:30 a.m.—COMBATING FOOD MISINFORMATION
Psychological Aspects of Food Faddism, Solon Samuels, M.D., VA Center, Los Angeles
Legal Aspects—Gordon R. Wood, Chief, Los Angeles District of Food and Drug Administration
Facts, Fallacies, Confusion—Elfriede F. Brown, Ph.D., Professor of Home Economics, University of Utah, Salt Lake City
Who Knows-Which Are Facts-Fallacies?—Anna de Planter Bowes, Chief, Nutrition Division, Pennsylvania Department of Health, Harrisburg
Detecting Misinformation—Adelia M. Beeuwkes, Associate Professor, School of Public Health, University of Michigan, Ann Arbor

1:00 p.m.—CONFERENCES AND DISCUSSION PERIODS (repeated Tuesday through Friday, limited to 75 persons each)—see Tuesday listing

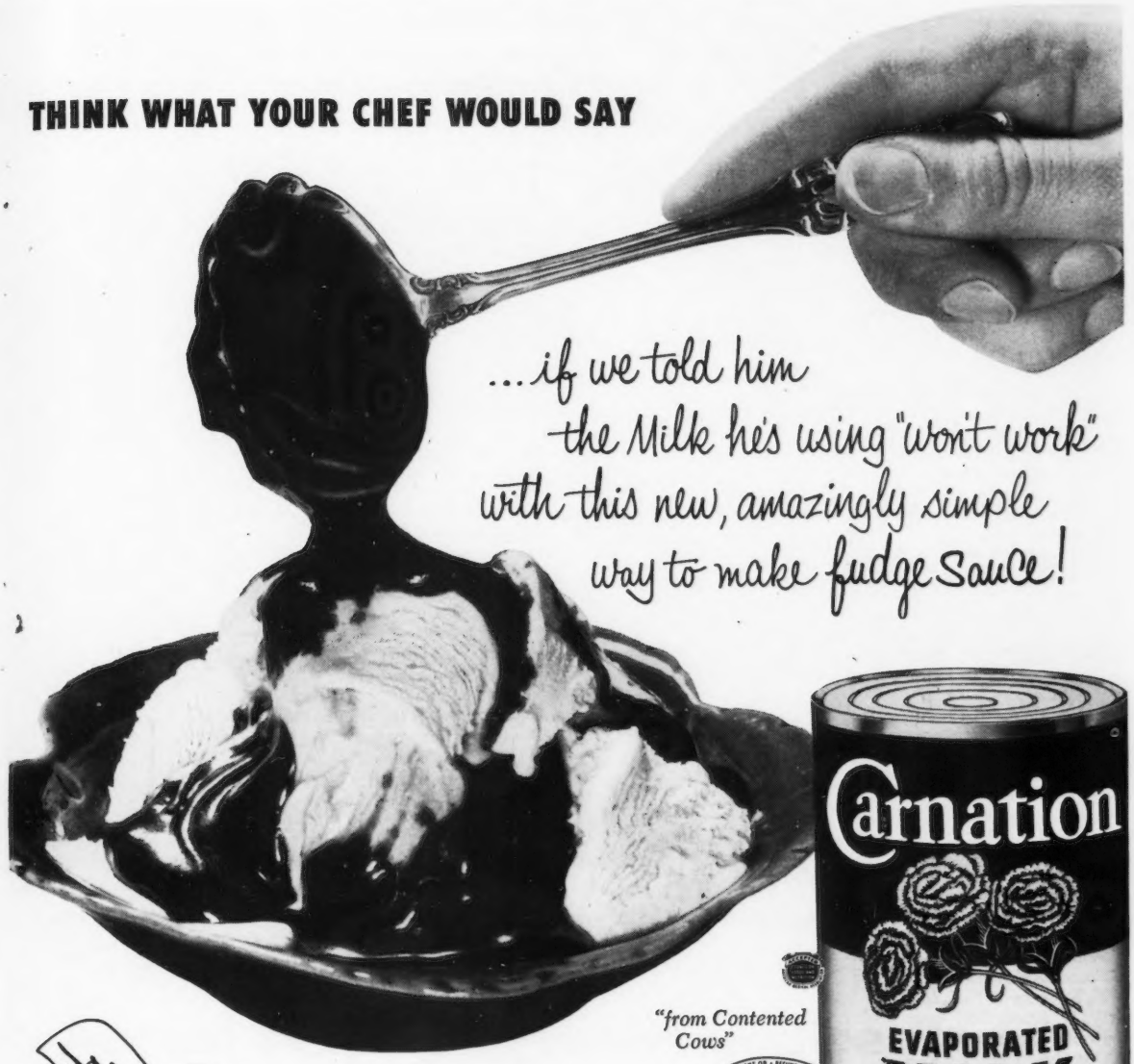
1:00 p.m.—SCHOOL LUNCH
Work Simplification in the School Cafeteria—George A. Reinhatler, Business Division, Long Beach City Hospital
Demonstration—Elizabeth Platt Cantley and Jane Hayes Barrett, School Lunch Supervisors, Board of Education, Long Beach

2:30 p.m.—TEACHING NUTRITION
Teaching of Nutrition—Jennie I. Rowntree, Ph.D., Director, School of Home Economics, University of Washington, Seattle
The Student Nurse—Henderika J. Rynbergen, Assistant Professor of Science, New York Hospital School of Nursing, Cornell University, New York City
The Medical Student—Doris Johnson, Ph.D., Director of Dietetics, Grace-New Haven Community Hospital and Assistant Professor of Nutrition, Yale University School of Medicine, New Haven
The Dental Student—Lucien A. Bavetta, Ph.D., Professor, School of Dentistry, University of Southern California, Los Angeles

2:30 p.m.—YOUR PERSONNEL
The Economy of Effective Organization—Dorothy A. Milavetz, Consultant, Medical Director's Office, E. I. DuPont deNemours & Co., Inc., Wilmington
Skills of Supervision—Lee W. Ralston, Director, Division of Trade and Industrial Education, County of Los Angeles, Los Angeles
Formation of Personnel Policies—Malcolm Macurda, Personnel Relations Supervisor, Pacific Telephone and Telegraph Company, Los Angeles

7:00 p.m.—ANNUAL BANQUET, Hotel Statler—Beulah Hunzicker, *Presiding*
Invocation—Reverend Glenn A. Rowles, Associate Superintendent, Congregational Conference of Southern California, Los Angeles
What America Means to Me—George M. Mardikian, Omar Khayyam's Restaurant, San Francisco
Presentation of the Lydia J. Roberts Award for 1953
Presentation of the Mary Swartz Rose Fellowship for 1953
Presentation of the Marjorie Hulsizer Copher Award for 1953—Frank B. Bradley, M.D., Director, Barnes Hospital, St. Louis

THINK WHAT YOUR CHEF WOULD SAY



...if we told him the Milk he's using "won't work" with this new, amazingly simple way to make fudge sauce!

"from Contented Cows"

Guaranteed by Good Housekeeping

HE'D PROBABLY "BLOW HIS TOP"

... because why should *we* tell him *his* business? But then, chances are he'd calm down, get curious and want to know more.

SO WE'D EXPLAIN that this easier-to-make, always smooth (never stringy) sauce is made with Carnation Milk. And that Carnation is *twice as rich* as the milk he's probably using now. We'd also point out that Carnation, unlike his present milk, is specially *heat-refined*... that this makes it a better-blending, flavor-enhancing, *superior* milk for sauces and *all* cooking and baking.

ONLY TROUBLE IS we can't tell your chef anything... for we don't know him. But *you* do. So maybe you'd rip out this page, recipe and all, and give it to him ... we hope!

CARNATION 1-2-3 FUDGE SAUCE

(Makes 2⅓ cups sauce)

1 large can (1⅔ cups) *undiluted* Carnation Evaporated Milk
2 cups sugar
3 squares (3 ounces) bitter chocolate

Combine Carnation, sugar and chocolate in saucepan over hot water or low heat. Cook about 15 minutes, stirring occasionally. Remove from heat; add vanilla. Beat briskly until smooth and thoroughly mixed. For a thinner sauce, add undiluted Carnation Evaporated Milk to desired consistency just before serving.

Carnation Performs Cooking Miracles Not Possible With Any Other Form of Milk

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LOS ANGELES, CALIFORNIA
AUGUST 25–27, 1953

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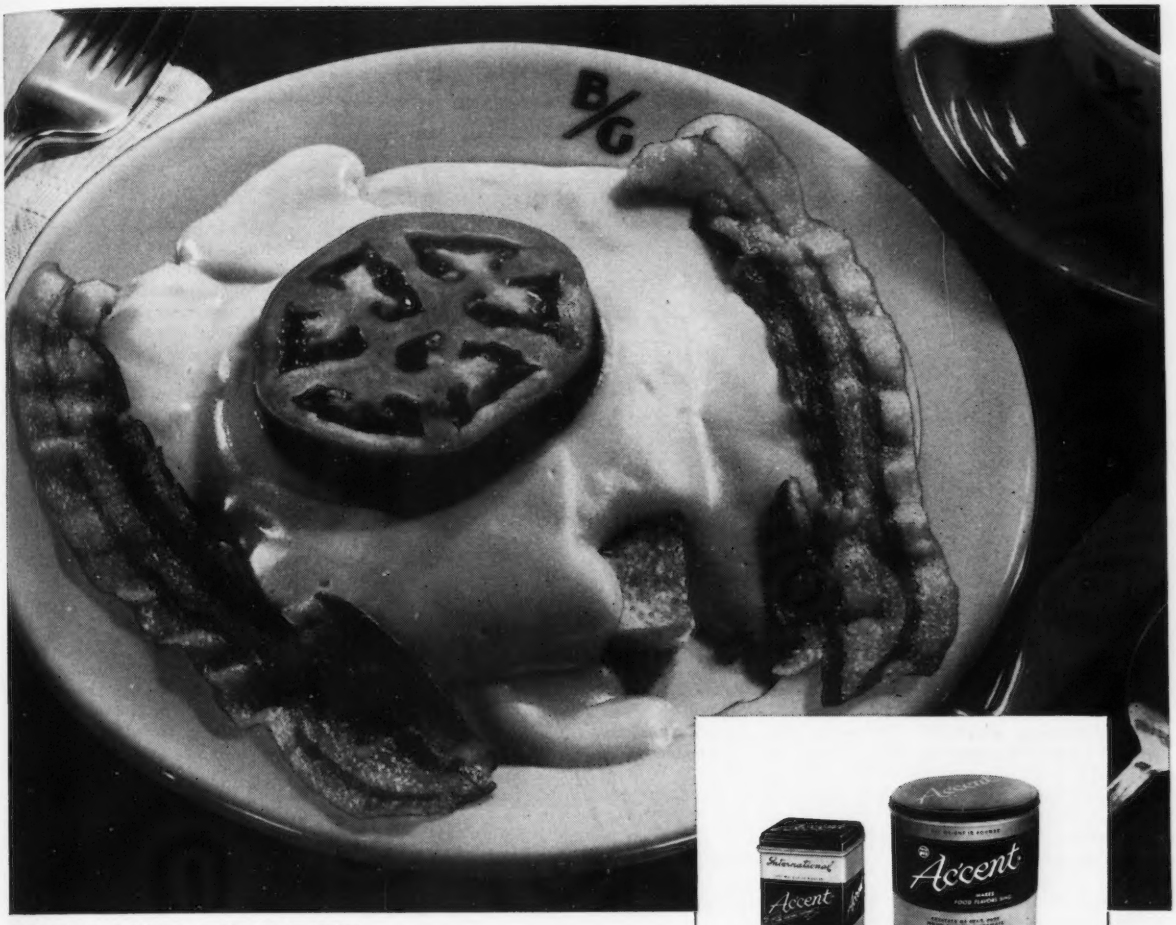

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B/G said, "We were amazed at the difference Ac'cent made—even in a dairy dish like cheese rarebit. It actually enhanced the matchless flavor that only aged cheddar possesses. This popular item has become even more popular since we added Ac'cent."

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News Notes

Photographic Contest Winners. The first award winner of the Third Annual A. D. A. Photographic Contest is Marjorie N. Peterson, Chief, Dietetic Service, VA Center, Los Angeles. "Modern Nutrition Teaching Methods" is the title of the prize-winning entry, shown above.

The second prize photograph, sent in by Mary Breed, University of Kansas Medical Center, Kansas City, shows a research nutritionist preparing a synthetic diet for experimental animals. Orville Crane and William M. McGrew, the latter a prize-winner of the 1951 contest, were recipients of the third prize this year. Also from the University of Kansas Medical Center, they submitted "Dietitian Teaching Medical Students."

All the above winners also received honorable mention awards for other photographs. Additional honorable mention recognition went to: Rita Jeanne Puryear, a recent graduate of the dietetic internship of the Aetna Life Insurance Company, Hartford; Ethel Jackson, home economist, Station WEWS-TV, Cleveland; Jane Stokes, Clinic Dietitian, VA Hospital, Tuskegee, Alabama; Betty N. Richmond, Assistant Director, Nutrition Clinic, New York Hospital, New York City; Nobuko Shiraki, Assistant Administrative Dietitian, Leahi Hospital, Honolulu; Louise Hatch, Director, Dietary Department, Massachusetts General Hospital, Boston; and Suma Bowles, Clinic Dietitian, VA Hospital, Houston.

Dr. Leverton Receives Borden Award. Dr. Ruth M. Leverton, Professor of Human Nutrition, University of Nebraska, and Director of Human Nutrition Research at the Nebraska Agricultural Experiment Station, has been named 1953 winner of the Borden Award for Fundamental Research in Nutrition and Experimental Foods. Presentation was made by W. A. Wentworth, The Borden Foundation, Inc., at the banquet of the American Home Economics Association in Kansas City on June 25. Dr. Leverton, author of the popular *Food Becomes You* and other books on nutrition as well as research papers, is at present engaged in specialized work on establishing human amino acid requirements. She received the Borden Award on the basis of research reported in fifteen papers published during the past five years.

Dr. Nelson Honored. Dr. P. Mabel Nelson, Professor of Foods and Nutrition, Iowa State College, was one of five of the college faculty members awarded Faculty Citations at the annual Alumni Day activities on June 13. Dr. Nelson, former Dean of the Division of Home Economics, introduced the dietetics major and the foods and nutrition and related science major in the foods and nutrition curriculum soon after her arrival at the college in 1923. The Faculty Citation is awarded to outstanding, long-time members of the college teaching, extension service, experiment station, and administrative staffs who have been a great inspiration to students and leaders in their fields. The recipient must have been associated with the college for a minimum of fifteen years.

Clinical Center Dedicated. The Public Health Service's new Clinical Center at Bethesda, Maryland, was formally dedicated on July 2 by Oveta Culp Hobby, Secretary of the Department of Health, Education, and Welfare. The Center is designed to strengthen the Public Health Service's efforts to solve the problems of chronic illness under research programs conducted by the National Institutes of Health. Six hundred guests, including scientists and government officials, were conducted on an inspection tour of the research facilities. Four days later, the first patients were received in the fourteen-story center, which combines specially designed space and equipment for laboratory and clinical investigation with facilities for five hundred patients.

Home Economics Congress. Some eighty American home economists will attend the Eighth International Congress on Home Economics in Edinburgh, Scotland this month. The group is to be led by Mildred Horton, Executive Secretary, American Home Economics Association, and an official advisory committee of eight members named to assist her.

"Home Economics at the Service of Life—Its Contribution to Individual and Social Progress" will be the general theme of the Congress. The North American group, including the U. S. and Canada, is in charge of a sectional meeting, "Careers for which Home Economics Training Is a Preparation." Miss Horton, as reporter-general for this meeting, will present a paper describing home economics careers in Canada, France, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the U. S. The American group will exhibit materials describing careers in home economics and representative booklets in home economics from five government agencies.

AHEA Convention. "YOU Are the Key to Better Relations" was the theme of the American Home Economics Association's 44th annual meeting, held in Kansas City from June 23 through 26. Dr. Robert L. Sutherland, Director, Hogg Foundation for Mental Hygiene, University of Texas, delivered the address at the opening session, "YOU Are the Key to Better Personal Relations."

At the second general session, John Harden, Vice-President, Burlington Mills Corporation, spoke on "YOU Are the Key to Better Public Relations." At this session, *Opinion Building*, a public relations guide for home economists published by the AHEA, was introduced. A symposium on public relations followed, in which home economists in different occupations participated.

International responsibilities of individuals were spotlighted at another session, when Anna Arnold Hedgeman, formerly Assistant to the Federal Security Administrator, chose as her topic, "YOU Are the Key to Better Relations in the Greater Community."

Catherine T. Dennis, State Supervisor of Home Economics Education, North Carolina Department of Public Instruction, Raleigh, has been elected President-

Chef's special of the month—

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Here's a brand-new salad idea that's been taking hold in a big way since it was introduced in our colorful national ads recently—bright, sparkling soufflé salads. Your customers are seeing them on TV and in all the leading magazines and newspapers.

The magic of this one is that you can prepare it quickly and easily—for about *3¢ per portion!*

Once you've tried it, you'll probably want to experiment with a few soufflé salad ideas of your own. But remember—you'll get *perfect* results only when you use genuine Jell-O flavored gelatins—the brand with exclusive "locked-in" flavor.

GARDEN SOUFFLÉ SALAD

1¾ cups (12 ounces) Lemon Jell-O
1½ quarts hot water (140°-160°F.)
⅜ cup vinegar
2 cups mayonnaise
1 teaspoon salt
¼ teaspoon pepper
¼ cup finely chopped onion
½ cup diced green peppers
1½ cups *each* diced raw cauliflower, shredded carrots, sliced radishes and diced celery
1½ cups chopped water cress, spinach, romaine, endive or escarole

1. Dissolve Jell-O in hot water.

2. Add vinegar, mayonnaise, salt and pepper. Blend with beater. Chill until slightly thickened. (Place in freezer or over crushed ice to shorten time.) Then beat until fluffy.

3. Fold in remaining ingredients. (If necessary, place bowl again in freezer or over crushed ice a few minutes to thicken Jell-O mixture slightly so that vegetables keep evenly distributed.)

4. Pour into individual molds or shallow pans. Chill until firm. Unmold or cut in squares. Serve on crisp greens with garnish of tomato wedges and mayonnaise. Makes 32 portions, 4 ounces each.

Now's the time for SOUFFLÉ SALADS!

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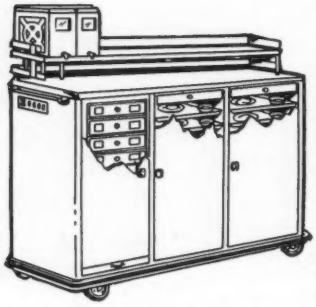

Model 18-D Hot-'N'-Cold cart: stainless steel; 60" long, 26" wide; counter 42" high; service shelf 6¼" above counter provides for 2 hot (or cold) beverage containers. Cart takes trays 14" x 18" up to 16" x 22". Circuit-breaker protects 110-120 v., 15 amp. wiring. *Accessories:* Thermal beverage containers, refrigerant cartridges.

Meals-on-Wheels

See M-O-W Exhibit at A.D.A. Conv., Aug. 25 to 27; A.H.A. Conv., Aug. 31 to Sept. 3.

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Elect of the AHEA. Edna A. Hill, Chairman, Home Economics Department, University of Kansas, has been elected one of the three Vice-Presidents, and Gertrude M. Holloway, University of Delaware Extension Service, has been elected Recording Secretary.

Plentiful Foods. The following foods are expected to be in plentiful supply during August, according to the U.S.D.A.:

Protein foods
Beef
Chickens, frying
Fish, fresh and frozen
Milk and dairy products

Vegetables, locally grown

Beans, green	Corn, sweet
Cabbage	Tomatoes
Celery	

Other foods

Ice cream	Potatoes
Lard and vegetable shortening	Salad oils and table fat

Interns Graduate. June 30 was graduation day for eleven dietetic interns at *Bronx VA Hospital.* They are: Mary A. Aragona, Mary E. Dolphin, Joan E. Kanyuck, Millicent G. Kleinman, Alice P. McGuigan, Patricia J. Moeschlin, Edna M. Plescher, Harriet Rubin, Carmella I. Santasania, Yolanda P. Troback, and Marianne C. Zygmunt.

Fulbright Awards. Under Public Law 584 of the 79th Congress, the Department of State and Board of Foreign Scholarships offer Fulbright Scholarships to the following countries:

Austria	Italy
Belgium and Luxembourg	Japan
Denmark	Netherlands
Egypt	Norway
Finland	Pakistan
France	Sweden
Germany	United Kingdom and colonial dependencies
Greece	
Iraq	

The Fulbright awards are specifically given for university lecturing and post-doctoral-level research. Applications for the year 1954–55 must be made by October 15, 1953. Full information may be obtained from: Conference Board of Associated Research Councils, Committee on International Exchange of Persons, 2101 Constitution Avenue, Washington 25, D. C.

Graduate students desiring to enroll for courses abroad or to pursue a directed program of studies at the predoctoral level should apply to their local Fulbright Adviser or directly to the Institute of International Education, 1 East 67th Street, New York City.

Government Publications. Chicken pimiento soup, beets with orange sauce, and peach roll are among the dishes featured in the new *Recipes for Quantity Service* (Food Service VII). The booklet, released as PA-223 by the Bureau of Human Nutrition and Home Economics, U.S.D.A., contains fifteen

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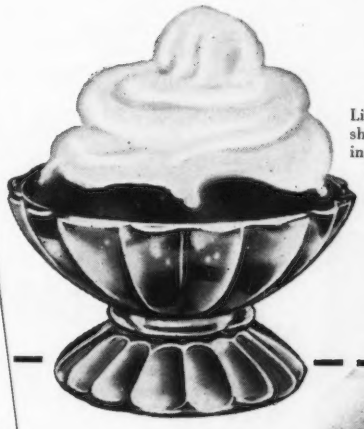
This letter is to tell you how satisfied we are, too, with your new line of Durapress sherbets. We find these sparkling glass sherbets make our foods look more appetizing...give us a sherbet service that is both attractive yet economical.

We intend to adopt them as standard equipment in our chain.

Cordially,
W. B. Williamson
General Purchasing Agent



Libbey "Durapress" sherbets are available in two sizes:
No. 5102 3½ oz.
No. 5103 4½ oz.

Make your appetizers and desserts look more tempting by serving them in sparkling glass . . . by serving them in Libbey "Durapress" sherbets. They are the most practical, dual-purpose sherbets on the market today.

Made of Libbey's regular high-quality glass, these sherbets take high sterilization temperatures in stride . . . stand up to the knocks of hard, everyday usage.

Libbey "Durapress" sherbets have a heavy glass base, modern shape, and appealing, easy-to-clean contour. "Durapress" sherbets are low in cost, yet amazingly strong and durable.

Your Libbey supplier is ready with samples and prices. See him or write direct to Libbey Glass, Toledo 1, Ohio.

Good food, tastefully prepared, and attractively served has long been a Blackhawk tradition. Here is their dessert table for their famed Sunday Smörgåsbords.

LIBBEY GLASS "Durapress" Glassware

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Libbey Durapress

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recipes developed in the Bureau's institutional kitchens. Quantities for 25, 50, and 100 portions are given. A wide cost range exists in the recipes listed. For hospital diets, seasonings or fat content may need to be modified in some of the recipes. Fluid whole milk was used in the laboratories; however, the equivalent in diluted evaporated milk or reconstituted nonfat dry milk solids will also give satisfactory results. This booklet, as well as previous issues in the *Recipes for Quantity Service* series, is available from the Bureau, Washington 25, D. C.

Fish Cookery for One Hundred by Rose G. Kerr is Test Kitchen Series No. 1 of the Fish and Wildlife Service, U. S. Department of the Interior. The booklet contains information on: nutritive value and market forms of fishery products; a guide for buying fish and shellfish; sections on the purchasing, preparation, and cooking of fish, oysters, shrimp, clams, lobsters, and crabs; recipes for fish sauces and stuffings; and suggestions for garnishes. Fifty-three recipes are contained in the booklet, which is for sale by the Government Printing Office, Washington 25, D. C., for 30 cents a copy.

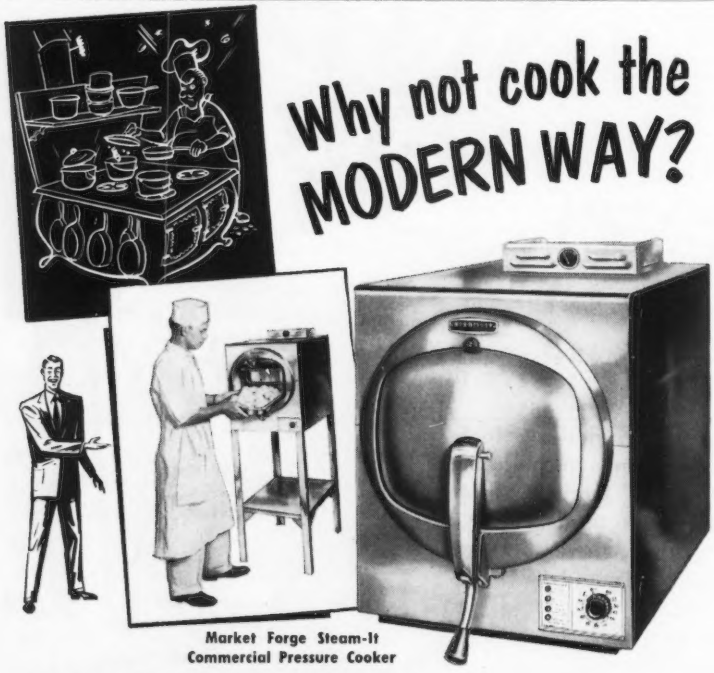
The Shortage of Young Women Workers has recently been released by the Women's Bureau, U. S. Department of Labor, as Leaflet 15. The problem is discussed in relation to the U. S. as a whole, to employers, and to the women themselves. Lowered birth rate during the depression, as well as early marriages and a high postwar birth rate, have combined to produce a shortage of women in the labor market. Five fields in which the shortage is most acute are listed: teaching, nursing, social work, medical work (including dietitians and nutritionists), and office work. Steps to alleviate the situation are listed. Copies of this leaflet may be obtained from the Government Printing Office for 5 cents each.

FAO Publication. *Maize and Maize Diets: A Nutritional Survey* has been released by the Food and Agriculture Organization as No. 9 in its FAO Nutritional Studies. The maize plant with its various parts is described, and pertinent nomenclature is defined. Subsequent chapters discuss the nutritive value of maize and the effects of household preparation, cooking methods, and storage thereon. Problems of maize-eating populations, such as pellagra, are covered, as well as improvement of the nutritive value of maize and of maize diets. The final chapter summarizes the chief nutritional defects of maize and measures suggested for their correction. The 94-page booklet contains 27 tables and is documented by 173 references. It may be obtained in the U. S. from $1 from: International Documents Service, Columbia University Press, 2960 Broadway, New York 27.

Reducing Booklet. *Eat and Grow Slim*, prepared by the American Institute of Baking, is now in its second edition. This attractive, rust-colored, thirty-page booklet has been completely rewritten and slanted to the overweight person rather than to nutrition experts. Statements made in *Eat and Grow Slim* have been reviewed and found acceptable by the Council on Foods and Nutrition of the American Medical Association, whose seal is on the back cover. Some of the chapters bear such titles as "You Need to Reduce IF," "Calculate Your Calorie Quota," "Slant Your Life," "If You Go Off Your Course," and "Trouble Spots Can Trip You." The Metropolitan Life Insurance Company tables of desirable weights for men and women, a six-page table of calories, and a week's sample menus are included. Copies are available from the Consumer Service Department, American Institute of Baking, 400 East Ontario Street, Chicago 11.

Sandwich Time. Another "August Is Sandwich Time" promotion is being launched this year by the *Wheat Flour Institute* and the *National Restaurant Association*. Food editors, radio and television home economists, grocers, and restaurateurs are putting special emphasis on sandwiches during August.

"Skill Counts—at the Sandwich Counter" is the title of a new, full-color, 10-min. movie produced jointly by the National Restaurant Association, the University of Chicago, and the Wheat Flour Institute. Designed to train employees in more efficient ways of making and merchandising sandwiches, it is part of a complete packaged program on sandwich making. The "package" also includes a full-color slide film showing in detail steps in setting up a workable sandwich counter and in making "indi-



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Commercial Pressure Cooker

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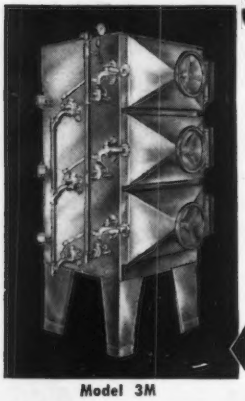
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SO— Why Not Finish The Job— Put The Pots Out To Pasture — And Cook The Modern Way In Market Forge Steam Cookers.

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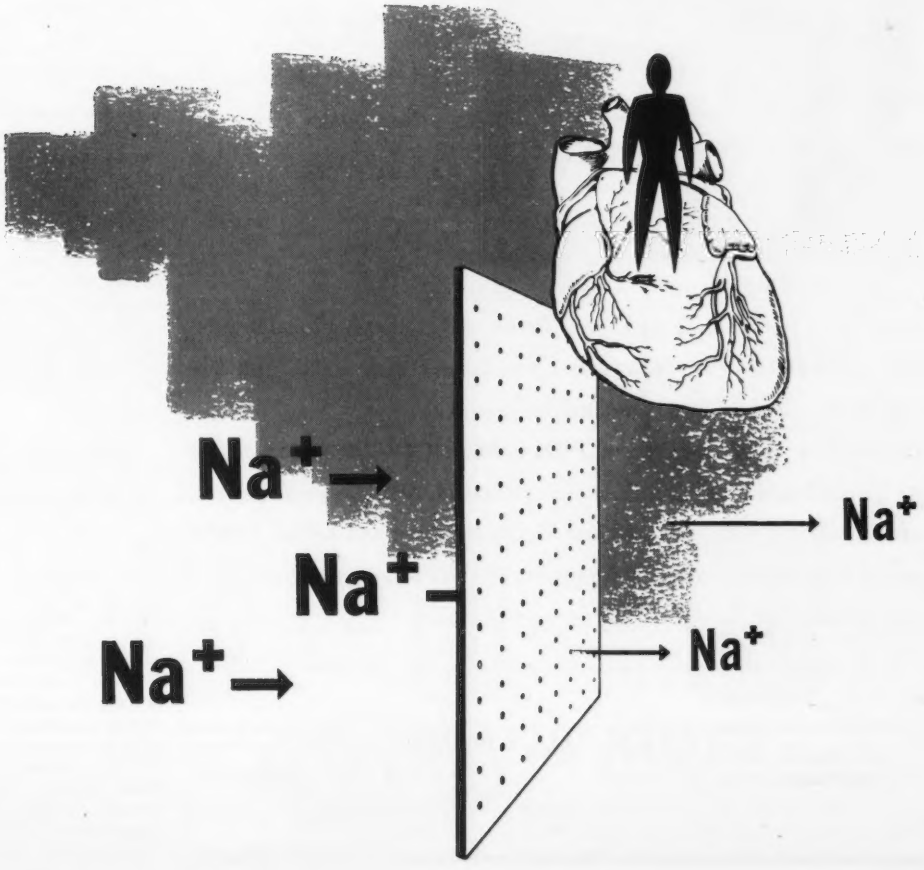

vidual order" sandwiches. Many new sandwich recipes, suggestions for garnishes, and a manual for the restaurant manager are also included. Inquiries regarding rental or purchase of the film should be directed to the Educational Department, National Restaurant Association, 8 South Michigan Avenue, Chicago 3.

Two mimeographed outlines prepared by the *American Institute of Baking* give directions for making cut and uncut sandwiches on a production-line basis. "What to Do" and "How to Do It" are given in steps. These materials are available from the Consumer Service Department, American Institute of Baking, 400 East Ontario Street, Chicago 11.

Booklet on Rehabilitation. Modern rehabilitation methods and the vast economies that may be achieved thereby are discussed in *Doing Something for the Disabled*. A twenty-eight-page pamphlet prepared by Mary E. Switzer and Dr. Howard A. Rusk, it contains a discussion of disability in general and its relation to national vigor and economy. A table shows public assistance expenses resulting from disability. Rehabilitation of women is discussed separately. Retraining for household tasks, the authors explain, can be done as can industrial retraining. No mass-production answer exists, it is emphasized, in the rehabilitation of disabled citizens, because of the human factor. Each person presents a complex problem to the rehabilitation specialist, with not only clinical but socioeconomic and vocational facets to his situation. Existing programs and their needs are discussed, including the shortage of trained personnel. Copies may be obtained for 25 cents each from: Public Affairs Committee, Inc., 22 East 38th Street, New York 16.

New York Nutritionists Meet. The semiannual meeting of the Upstate New York Nutritionists and Home Economists was held on June 3, 1953, at Lake Placid in conjunction with the Annual Health Conference. Subject of the discussion was the medical and social needs of older people.

"The Challenge of Aging" was presented by the opening speaker, Dr. Raymond Harris, Attending Cardiologist and Assistant Medical Director, Ann Lee Home, Albany. A panel followed with a discussion on "How We Help to Meet These Needs" with representation by a public health nurse, a community consultant on aging, a welfare administrator, and a nursing home operator. Dr. I. Jay Brightman, Assistant Commissioner for Welfare Medical Services, State Department of Social Welfare, Albany, was moderator.

Better Food for Baby. Babies are slated for even better food, through the efforts of scientists at several state agricultural experiment stations. New York State scientists are working on carrots, green beans, peaches, apricots, and prunes. Carrots are the subject of an important study: their flavor needs improving to avoid bitterness, and both the growing and processing are being studied. Improved types of squash and white-seeded green beans for baby fare have been developed by plant breeders. Other foods under study are peach purée for improved color, texture, and consistency, and varieties of apricots and prunes.

The Massachusetts Agricultural Experiment Station reports that browning of strained foods at the top of the jar is caused by oxygen from air which comes in contact with the food in the jar. Scientists there discovered that the addition of ascorbic acid helped to prevent darkening. Closures of jars have also been improved to reduce the seepage of oxygen.

Proper Milk Care. Consumers need to be reminded that milk must be properly refrigerated, according to a study made by the West Virginia Agricultural Experiment Station of the keeping quality of bottled pasteurized milk in homes in summer. For good flavor, milk should go into the refrigerator promptly after delivery; bottles should be taken out only to pour milk for immediate use and then should be replaced with caps firmly in place. Cold storage limits the increase of bacteria and acid, while close covering prevents milk from absorbing off-flavors. Bottled pasteurized milk, properly kept, has good flavor for three or four days after delivery but changes rapidly to poor flavor after five to six days. Dairy companies and homemakers should both note this fact, which shows that delivery

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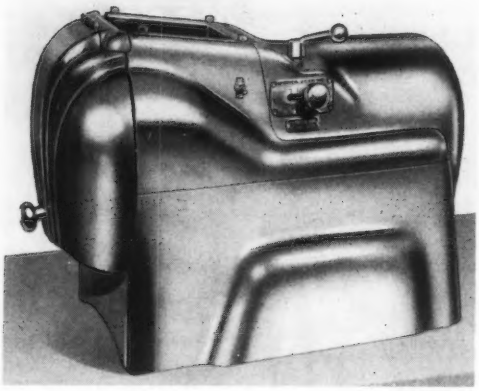

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Wherever Fine Foods are served, **THE O'BRIEN DICER** is one of the most **Valuable** pieces of equipment in portion and cost control. It soon **Pays** for itself by cutting **Waste** and **Saving** of **Time** and **Labor.** It is a **Must** for **Fast, Clean, Profitable** processing of foods where perfect uniform shapes—from a flake to a French Fry—are needed.

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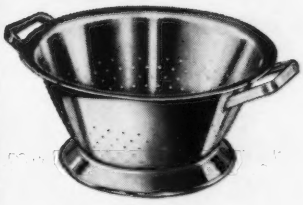
BRIGHTEN the life of your kitchen help with easy-to-clean Vollrath stainless steel food service and storage equipment. Bring new efficiency and greater economy to food handling with the stainless steel ware that makes any kitchen a better place to work.

And, Vollrath is the name to remember for lasting beauty. Lustrous, solid stainless steel ware brightens with use . . . keeps your kitchen new looking longer.

Whether you're newly equipping, modernizing or adding, choose Vollrath stainless steel equipment. It's easy to order from the big Vollrath catalog.

NEW DOUBLE BOILER—No. 7704. Seamless construction makes easy cleaning. 4¼ qt. outside, 4⅛ qt. inset capacities. Larger size (No. 7711) also available.



COLANDER—No. 5715. Generous handles simplify use. Large 11 qt. capacity.

NEW ROUND DISH PAN, WITH HANDLES—No. 7212—No. 7224. Durable stainless steel construction stays new looking through countless washings. 12 and 24 qt. capacities.

NEW FRUIT AND ICE BOWL—No. 6915. The bowl of a million uses. As a server or for utility purposes. 5 qt. capacity.

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SECTIONAL PANS a whole series of steam table pans for interchangeable combinations.

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Based on normal nutritional requirements for adults, the menu patterns, sample suppers, and pointers on meal planning have their place in any household. Practical ideas for making the work of the manager easier and pleasanter include a weekly marketing guide, hints for economy in buying and storage, and suggestions for serving.

This is a project of the Diet Therapy Section of The American Dietetic Association.

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Ten copies 3.75

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every other day or three times weekly is satisfactory if care is exercised by both milkman and consumer.

J. Marie Melgaard. Word has been received of the sudden death on June 8 of J. Marie Melgaard at the Municipal Tuberculosis Sanitarium in Chicago. She had also been on the staffs of the University of Oklahoma Hospitals, St. Luke's Hospital in Denver, and the Evangelical Hospital of Chicago. An A.D.A. member since 1931, Miss Melgaard had been active in professional activities and served as chairman of the committee which prepared the A.D.A. book, *Care of Food Service Equipment*, published in 1944. For several years she had served as dietetics editorial consultant for the magazine, *Hospital Management*.

News of State Associations

Alabama Dietetic Association. Officers for 1953–54 of the Alabama Dietetic Association will be: President, Dr. Bessie L. Davey, University of Alabama, Tuscaloosa; President-Elect, Florence H. Lutz, Druid Hospital, Tuscaloosa; Secretary, Mary Ida Flowers, Alabama College, Montevallo; and Treasurer, Berenice K. Clark, Huntingdon College, Montgomery.

California Dietetic Association. Members of the *Bay Area* joined forces in March with the Home Economists in Business, to present a benefit carnival at the University of California campus in Berkeley. Proceeds from the event are to be divided between aid to a diabetic camp and the purchase of UNESCO stamps to help educate professional persons. The group met in April for a tour through the new *Sunset* Magazine Building in Menlo Park, with emphasis on the test kitchen. In May, the group met at Mills College, Oakland. After being given a brief background of the college and its dietetics curriculum, members toured the campus. In each residence hall, the kitchen was visited and a dietetic intern described a different aspect of the internship. In June, Dr. Darden Fuller, Department of Agricultural Economics, University of California, spoke to the group on "Understanding the Economic Factors in Food Consumption." Dr. Fuller noted income as the major factor affecting prices, as he traced trends in food prices and consumption over the past ten or twelve years. Next year's officers of the *Bay Area* will be: Chairman, Eva Gordon Altman, San Francisco; Vice-Chairman, Grace E. McGuinness, San Francisco; Secretary, Mary May Lacy, Samuel Merritt Hospital, Oakland; and Treasurer, Henrietta Henderson, University of California Hospital, San Francisco.

Members of the *Los Angeles Section* met at the Children's Hospital in April. In addition to touring the new kitchen, they heard Anthony Sgro, Swift and Company, discuss "Techniques in Batters and Doughs." He also showed a film, "The Inside Story of Cake Baking," a

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CELLU SOYAMAISE (*Green Label*)—A tangy mayonnaise type dressing made from soy bean oil, eggs, vinegar, without added salt. Sodium content only 36 mg. in 100 grams.

CELLU DIETETIC TUNA—Packed in water without added salt. Sodium content 70 mg. per 100 grams of fish. 6½ oz. tins. Tuna salad pictured above made with Cellu Tuna and Cellu Soyamaise.

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CHICKEN SOUP	1.0	0.56	3.2	26.3	1.5
POWDERED CONSOMME	neglig.	0.48	0.29	3.2	0.6
BEEF SOUP	0.85	0.85	3.2	25.0	12.8
JELLIED CONSOMME	neglig.	3.15	0.21	13.7	1.4

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record of microscopic studies, and discussed the uses of shortening and fats in baking and the ratio of ingredients. The May meeting of the *Los Angeles Section* was held at the VA Center, where Dr. Ralph Goldman, Chief, Metabolism Section, spoke on "Diet in Renal Disease." Officers for the coming year of the *Los Angeles Section* will be: Chairman, Evelyn Cram; Chairman-Elect, Mary Louise Anderson Gregg; and Secretary-Treasurer, Ruth Schemmel.

In April, the *San Jose Section* was shown a color film of Camp Whitaker, a diabetic camp in the high Sierras. New officers for the *San Jose Section* will be: Chairman, Kathleen Weber, Sequoia Hospital, Redwood City; Chairman-Elect, Fern Geyer Wendt, San Jose State College; and Secretary-Treasurer, Marjory Kean, O'Connor Hospital, San Jose.

Hawaii Dietetic Association. Beulah Hunzicker, A.D.A. President, visited Hawaii during the latter part of May on a Naval Educational Tour and addressed members of the Hawaii Dietetic Association on the goals of A.D.A. at a dinner meeting. The final meeting of the Hawaii Dietetic Association was held at Queen's Hospital, Honolulu, in May. Graduating dietetics majors of the University of Hawaii were guests at a tea, following a symposium on the different types of food service positions available in the community.

Iowa Dietetic Association. Community Nutrition Section members of the Iowa Dietetic Association have appeared as speakers on food and nutrition at Parent-Teacher Association meetings in the state. Members of the *Des Moines Dietetic Association* gave talks at six preschool conferences, and the *Iowa City Dietetic Association* assisted with two such meetings.

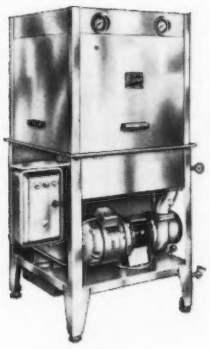
The Professional Education Section has contributed to the A.D.A. foreign library project through UNESCO gift coupons. The contribution will be applied on an automatic titrator for precise solution mixture to be used at the Institute of Nutrition in Manila.

Officers for 1953–54 of the Iowa Dietetic Association will be: President, Darleen Pullins, St. Joseph's Hospital, Ottumwa; President-Elect, Shirley Needham Wilkins, Children's Hospital, Iowa City; and Treasurer, Margaret Osborn, State University of Iowa, Iowa City.

Newly elected officers of the *Iowa City Dietetic Association* include: President, Dorothy Ruggles, VA Hospital; Vice-President, Joan Sheehan, Mercy Hospital; Secretary, Jane Teasdale Buzzell, VA Hospital; and Treasurer, Joan Lint, University Hospitals.

Members of the *Mississippi Valley Dietetic Association* met in May at St. Luke's Hospital, Davenport, for a tour through the remodeled dietary department. Results of the election of officers were announced as follows: Chairman, Luana Keim Friesth, Coal Valley, Illinois; and Vice-Chairman, Mary Brown Carroll, Moline (Illinois) Public Hospital.

North Carolina Dietetic Association. Charlotte was headquarters for



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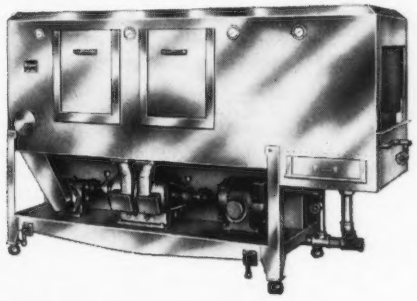
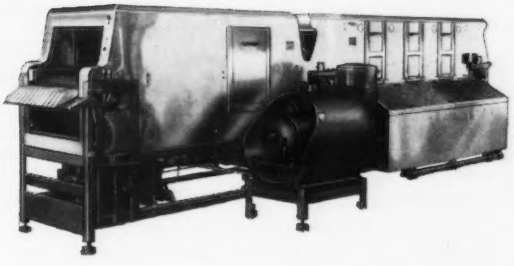
HIGH CAPACITY MACHINE PRODUCES 6,000 DISHES PER HOUR, CUTS COSTS

Model R-40 — Preflushing eliminates the messy prewash station, cuts labor and detergent costs. Colt's "Water Main" method *rinses, scraps* and *wets* dishes with clean fresh water, prevents concentration of food soil or bacteria because pre-flush water isn't used over and over. Measures 59" high x 30" wide x 90" long, table to table.

ASSEMBLY LINE PROCESS WASHES, SANITIZES AND DRIES

Model C-3-C-300 — Washer-drier combination *washes, sanitizes,* and *dries* more dishes per hour per square foot of floor space than any other combination. Will process tableware for up to 2500 persons per meal. Greatly reduced handling at "clean" end with less labor in less space. Cushioned conveyor prevents chipping. 207" long overall x 65½" wide x 60¼" high.





COLT AUTOSAN

COLT'S MANUFACTURING COMPANY, AUTOSAN Division Hartford 15, Connecticut

DISHWASHING, SANITIZING AND DRYING MACHINES • VEGETABLE PEELERS

the spring meeting of the North Carolina Dietetic Association, May 20 and 21. Sessions, held at Charlotte Memorial Hospital and Presbyterian Hospital, included the following speeches:

"Today's Dietary Costs"—J. R. Felts, Jr., Duke University
"Maintenance and Life Span of Equipment" and "New Equipment"—panel discussions
"This Could Happen to You"—Josephine Kerr, President, North Carolina Nurses' Association
"The Psychological Approach to Pediatric Dietetics"—Dr. Jasper Hunt
"The Psychological Approach in Gastro-Enterology—Dr. Monroe T. Gilmour
"Nutrition in Puerto Rico"—Frances MacKinnon

The Diet Therapy Section of the North Carolina Association voted at the meeting to work on a state diet manual. The Professional Education Section was asked to study a project of offering a $100 scholarship to a college senior planning to intern. The Association also voted that the President appoint a committee to develop a questionnaire concerning salaries of dietitians and food service managers for distribution throughout the state.

Mary Anderson, North Carolina Memorial Hospital, Chapel Hill, is new President of the North Carolina Dietetic Association; and Rebecca Rogers, Watts Hospital, Durham, is President-Elect.

Oklahoma Dietetic Association. Alma White, Oklahoma A. & M. College, Stillwater, was elected President-Elect of the Oklahoma Dietetic Association for 1953–54, and Frankie Andrews Roberts, Oklahoma City, was elected treasurer, at the Association's business meeting in March.

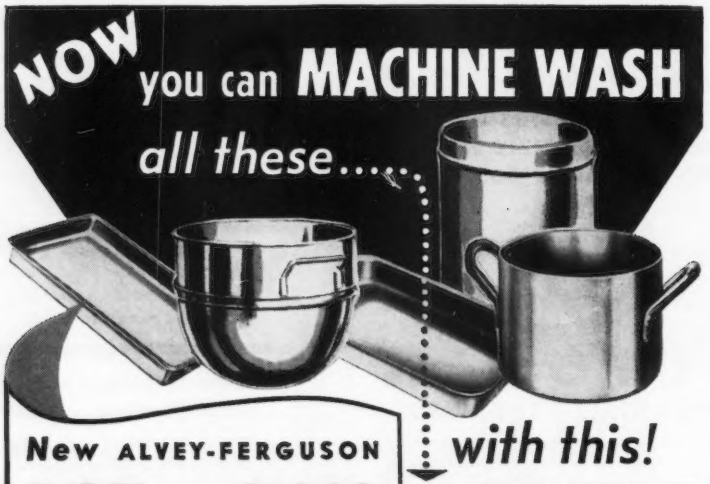
Members of the *Oklahoma City Dietetic Association* recently heard Martha Ann Russell, Food Service Director of the city's public schools, explain the department's operations, including the purchasing and preparation of food, menus, and the training of employees.

The *Tulsa Dietetic Association* in April heard Kisoon Hyun, a dietetic intern at Oklahoma A. & M. College, talk on customs and food habits in her native Korea. The group voted $10 for educational materials that Miss Hyun could use on her return to Korea.

Texas Dietetic Association. The *Dallas Dietetic Association's* April meeting was held at Texas State College for Women, where members were guests of the Denton group. Senior foods and nutrition students furnished the entertainment.

The *Denton* dietetic group of Texas State College for Women recently financed the trip of Mary Ann Pinckney, a senior at the college, as a student representative to the Texas Dietetic Association convention in Houston in April.

Dietetic interns of the VA Hospital, Houston, were in charge of the *South Texas Dietetic Association's* program in April. They presented a round table of current literature in diet therapy and employee training.



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POT and PAN WASHER

Occupies Floor Space Only 3'-4" x 5'-2" —Can be furnished for gas, steam or electric heating.

MODEL MK "PANHANDLER"

YES—now you can machine-wash and rinse all types of pots, roasting pans, steam table pans, kettles and utensils—even 80-quart mixing bowls.

No more slow, old-fashioned soaking and scraping. This *new* A-F Model MK "Panhandler"—with automatic wash timer—uses the powerful A-F Super-Spray pressure system which removes even the most obstinate residues from pots and pans.

You'll be amazed by the compactness of the A-F Model MK—its surprisingly low cost, its efficiency—and the way it lowers your kitchen costs and quickly pays for itself!

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241 Disney St. *Established 1901* Cincinnati 9, Ohio

Also Engineers and Manufacturers of A-F Pan and Rack Washers for Bakeries

Association Activities

A.M.A. Meeting. The American Medical Association held its 102nd Annual Meeting in New York City, June 1 to 5, with a record-breaking attendance of over 20,000 physicians. An A.D.A. exhibit on the adequate low-calorie diet was included among some 260 other scientific exhibits. The revised adequate low-calorie diet leaflet for patient use by physicians was displayed along with other material. Jane Andrews and Betty Richmond were co-chairmen of the local dietetic group manning the booth. Clara Zempel from headquarters office assisted.

A.H.E.A. The vocational guidance exhibit "Be a Dietitian," created considerable interest at the Annual Meeting of the American Home Economics Association held in Kansas City, Missouri, June 23 to 26. Betty Pote Bowman was chairman of the booth attendants.

Executive Board. The A.D.A. Executive Board met in Chicago in the headquarters office, June 26 and 27.

A.H.A.-A.D.A. The joint committee of the American Hospital Association and The American Dietetic Association met in Chicago on June 29. Activities of mutual interest to both organizations were discussed.

NOW A Different Dessert and Salad FOR DIABETICS EVERY DAY!

YOU KNOW how difficult it is to add variety to the menus of your patients on diabetic and reducing diets. That is why D-Zerta—the delicious saccharin-sweetened fruit-flavored gelatin—is such a wonderful discovery. For with D-Zerta, patients on low-calorie and low-carbohydrate diets can choose from more than 30 different desserts and salads. Your patients are provided recipes for all these dishes without charge.

D-Zerta is available in packages of 6 and 20 one-portion envelopes . . . directions and analysis of contents on each envelope.

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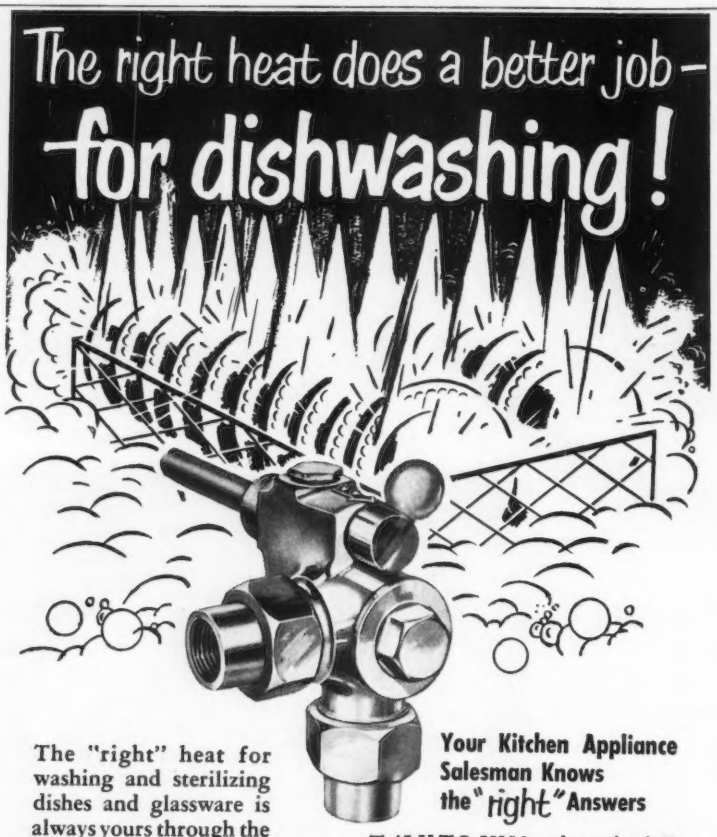
News of Advertisers and Exhibitors

The *California Cling Peach Association* in May introduced a new 35-mm. Technicolor food movie, "Friend in the Cupboard." As background, it presents a short history of the peach industry from the early discovery of the peach in China by Genghis Khan to the present day, when it is one of the major food industries in California. The body of the film is devoted to showing twenty-four appetizing and attractive ways to serve canned cling peach halves and slices and canned fruit cocktail. Salads, entrées, and desserts for everyday and party occasions are presented, with demonstrations of preparation methods done by home economists of the California Foods Research Institute. The suggestions are easily adaptable to quantity service. Running time for the film is 20 min.

Quantity recipes for soufflé salads, currently being promoted in the women's consumer magazines, have been worked out by *General Foods'* Institutional Food Service. Introduced at the National Restaurant Association convention in May, a folder giving eight soufflé salad recipes is now available for national distribution. Yield for each recipe is 32 portions. The cost for preparing the salads in quantity is estimated to range from 3 to 6 cents for a 4-oz. portion.



The "right" heat for washing and sterilizing dishes and glassware is always yours through the proper use of your *Robertshaw*® Heat Control on your modern dishwashing equipment. For this Control assures accurately maintained water temperatures that result in savings on fuel and savings on labor. Serving your customers spotless crockery and sparkling glassware *saves* valuable patronage, too.

Your Kitchen Appliance Salesman Knows the "right" Answers

TALK TO HIM and get the full story of Controlled Heat. He can show you how the proper use of your *Robertshaw* Heat Control assures you of getting and maintaining the "right" heat on coffee urns, ranges, deep fat fryers, dishwashers and steam tables—"right" for savings on fuel, foods, labor...and for making satisfied customers.

Robertshaw-Fulton
CONTROLS COMPANY
ROBERTSHAW THERMOSTAT DIVISION • YOUNGWOOD, PA.

General Foods Corporation's Maxwell House Division now has a separate sales department. The new sales force will serve retail and wholesale grocers and institution operators with regular and instant Maxwell House and Sanka coffees, as well as other coffees marketed by the division. Formerly Maxwell House coffees were sold through the General Foods Sales Division.

Anetsberger Brothers has introduced a new "Anets" In-Plant Coffee and Food-Serving Cart for use in factories at "time-out" periods and even lunchtime. Furnished in three stainless steel models, the "In-Plant" Coffee and Food-Serving Cart is available with or without heating elements for food compartments. There is also an optional food warmer unit, which holds standard pan inserts of various sizes for meats, gravies, vegetables, and baked goods.

Gerber's Meat Base Formula is a new "first" in pediatric foods. Designed to provide high-quality protein for infants allergic to cow's milk, the product is composed of strained beef mechanically dispersed with other hypoallergenic nutrients. The formula, which mixes with water, may be fed from birth throughout infancy. Only slightly thicker than evaporated milk, it is said to approximate evaporated milk in protein, fat, carbohydrate, calcium, phosphorus, and vitamin D content. The special dietary use of the Meat Base Formula has dictated its distribution through drug channels rather than the grocery trade. It is available to hospitals or retail drug stores from wholesale pharmaceutical firms.

Strained Egg Yolks is another new *Gerber* product to tempt tiny palates. This iron-rich, sterilized food is available in 3-oz., ready-to-use cans holding about 3¼ cooked yolks. The label announces that 2 level Tbsp. are equal to one yolk. Strained Egg Yolks, containing only yolks, water, and salt, have a custard-like consistency appealing to spoon-fed infants, who balk at lumpy, home-prepared egg yolks. Prompt refrigeration is important in keeping leftovers after the baby has been served.

Pacific Coast Canned Pears has published a four-page folder titled "Bartlett Pear Flashes," which gives quantity recipes for: pear milk shake, spiced Bartlett pears, two pear salads and three dressings for pear salads, and five pear desserts.

Champion Dish Washing Machine Co. has introduced a "Jet Swirl" dishwashing machine, with a new three-armed swirl wash for polishing action. In addition to this upper revolving assembly, the machine is equipped with stationary lower wash sprays. Diagonal rinse sprays from nozzles in the four top corners of the machine and vertical sprays from twelve nozzles below are other features of the machine.

Klenzade Products, Inc. has announced a new aluminum cleaner, Formula HC-70. This product, it is claimed, will thoroughly clean aluminum without pitting it and is suitable for "reconditioning" darkened aluminum and removing heavy, baked-on grease deposits. It is an alkaline detergent designed for commercial equipment cleaning by hand or soak-

Dietitians!

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EMBLEMS OF ACHIEVEMENT

As an Army Medical Specialist, you can pursue a life rich in professional attainment and real personal satisfaction. Enjoy these unique career advantages:

- ★ The prestige of an officer's commission in the United States Army.
- ★ The satisfaction of serving your country in a position of vital responsibility.
- ★ Specialized training in the latest techniques and developments in the field of dietetics.
- ★ Congenial surroundings for both work and play . . . including comfortable, attractive living quarters and modern, well-equipped hospitals and clinics.
- ★ An opportunity to widen the scope of your professional knowledge by working with many different types of patients.

Serve with the best, as one of the best! Fill out coupon today.

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United States Army, Washington 25, D.C.
Attention: Personnel Division, Dept. 2-D

Please send me further information on my opportunities as a Dietitian in the United States Army.

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NEW GARBAGE DISPOSER FOR DIET KITCHENS!

THE NEW

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COMMERCIAL *PULVERATOR* ®

MODEL DK 3

specially designed for diet and ward kitchens in hospitals.

HERE'S HOW WASTE KING CUTS COST, SPEEDS SERVICE, IMPROVES SANITATION—

- Saves space formerly used by garbage cans.
- Saves time, saves labor cost. Eliminates handling, washing and replacement of cans.
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Exclusive "Hush-Cushions" give quiet, smooth operation. Exclusive Lifetime Grind Control prevents clogging. Swivel impellers assure jam-free operation.

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AMERICA'S FINEST GARBAGE DISPOSER

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ing methods. It contains both special corrosion inhibitors and active wetting agents for effective soil penetration.

S. Blickman, Inc., recommends its Tri-Saver Urn as particularly adaptable to the bulk brewing of tea. The stainless steel specially-constructed bottom filters the brew edgewise, by capillary attraction. Tea is placed in the filter and boiling water poured or siphoned over it. The brew filters into the liner below and is dispensed through the draw-off faucet. For iced tea, larger amounts can be drawn off into pitchers or other containers. The same urn can be used for brewing coffee.

Metropolitan Wire Goods Corporation announces a special tray-washing rack which eliminates hand washing of plastic, aluminum, and stainless steel trays. The rack, available for use in all models of dishwashing machines, features individual tilted compartments which protect the trays.

The *Chicago Dietetic Supply House* has recently issued the fifteenth edition of its allergy recipe booklet using Cellu Allergy Diet Foods. The booklet contains hints on foods to use or avoid in diets where wheat, milk, or eggs, or all three, must be eliminated, as well as baking instructions and suggested menus for one day. Sixty-seven recipes are presented, some of them with adaptations for different types of allergies.

"Table of Food Values with Approximate Measures" is another publication of the *Chicago Dietetic Supply House*. This small folder gives the caloric, glucose, carbohydrate, protein, and fat content of 100-gm. portions of a great variety of foods, including Cellu canned fruits, vegetables, and juices. Also given is the approximate measure of food yielding 100 gm.

"America's Home Favorites" is the title of a new brochure published by *National Biscuit Company*, featuring Nabisco individual service varieties available to hotels, restaurants, and institutions. The booklet gives detailed information on all products, including packing method, cost per serving, and count per pound.

"A Summary of the Iowa Breakfast Studies on Men Past 60 Years of Age" has been released by *Cereal Institute, Inc.*, as part of the 1953 September Better Breakfast Month program. The "Summary," based on four papers published in this JOURNAL, is a twelve-page illustrated booklet, documented with eighteen references.

Aatell & Jones' Doily-of-the-month plan, in which a different topic of pictorial interest is presented each month, is now a subject of public decision. The firm plans to let diners-out throughout the country vote on their choice for future topics. Members of the Doily-of-the-Month club will receive ballots to distribute to patrons during August and September. Later, a master ballot will be filled out by all participating organizations, based on patrons' votes. Suggested themes for future series are: continuation of the food series, famous Americans (born in month of issue), famous ships, homes of historical background, national shrines, pioneers, and early history of automobiles.